Water Plant Optimization Study

STONEY POINT (TOWNSHIP OF TILBURY NORTH) WATER TREATMENT PLANT

June 1991

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WATER PLANT OPTIMIZATION STUDY

Stoney Point
(Township of Tilbury North)
Water Treatment Plant

Project No. 7-2028

June 1991

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Please note that some of the recommendations contained in this report may have already been completed at time of publication. For more information, please contact the local municipality, or the Water Resources Branch of the Ministry of the Environment.

SUMMARY OF FINDINGS AND RECOMMENDATIONS

The purpose of the Water Plant Optimization Study is to prepare a document that describes the present condition of a water plant with respect to equipment and operation as well as information regarding the quantity and quality of raw and finished water. The report attempts to make recommendations that will allow the plant to operate in an optimum condition so that the best possible finished water quality is achieved with emphasis on particulate removal and disinfection. The approach is to optimize the existing facilities and make recommendations for short term and long term improvements. It is anticipated that the optimization study documents will be updated annually.

The Township of Tilbury North will be undertaking a project to modify and expand the Stoney Point Water Treatment Plant. The work will include:

- Flow measuring systems.
- Coagulant and coagulant aid storage and feed systems.
- Gravity filters complete with filter feed pumps and backwash water pumps.
- Treated water storage and high lift pumps.
- Diesel engine generator.
- Fluoride storage and feed system.
- Renovations to existing building to provide a new chlorine room, office, lunchroom and washroom.
- Replacement of obsolete and/or inadequate equipment.

In an effort to optimize particulate removal and disinfection at the Stoney Point Plant until the plant expansion project is completed, the following are suggested:

Physical Improvements

- Make any necessary repairs and modifications on the clarifier sludge blow down system to allow sludge to be removed more frequently and for shorter intervals and therefore improve clarifier efficiency.

- Modify the alum feed system to allow alum solution to be continuously fed into the clarifier inlet pipe.

- Install a continuous flow-through turbidimeter (with recorders and alarms) to monitor raw water, clarifier effluent and filter effluents.

- Install a chlorine residual analyzer to monitor plant effluent chlorine residual.

- Install an extensive alarm system for high clarifier effluent turbidity, high filter effluent turbidity, low chlorine residual, low plant discharge pressure, and intrusion.

- Install perimeter fencing in order to improve plant security.

Studies

- Conduct a study to determine the time that filtering-to-waste following a filter backwash should last to ensure all the backwash water has been displaced before putting the filter in operation.

- Investigate the phenomenon of entrained air occasionally causing the water to appear milky.

Other Recommendations

- Produce an operating manual for the plant.

- Reinstate the clarifier sludge sampling system and institute a comprehensive sludge sampling program.

- Investigate the feasibility of reinstating the original low lift pump control system if it can be done without costly equipment replacement.

- Consider increasing plant staff to ensure the continuous supply of acceptable water quality.

- Modify testing and record keeping procedures to include clarifier effluent and filter effluent turbidities, and more frequent testing and recording of raw water and plant effluent turbidities.

- Aluminium residuals should be measured and recorded routinely and used as an operating tool.

- Modify bacteriological sampling and testing procedures to include the shipment of duplicate bacteriological samples to the London MOE lab on a monthly basis.

- Initiate a bacteriological test record keeping system.

- Use Ministry of the Environment Utility Monitoring System forms for summarizing operating data.

WATER PLANT OPTIMIZATION STUDY

STONEY POINT

WATER TREATMENT PLANT

TOWNSHIP OF TILBURY NORTH

ONTARIO MINISTRY OF THE ENVIRONMENT

PROJECT NO. 7-2028

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TOWNSHIP OF TILBURY NORTH (STONEY POINT)

WATER TREATMENT PLANT

ONTARIO MINISTRY OF THE ENVIRONMENT

PROJECT NO. 7-2028

INTRODUCTION AND TERMS OF REFERENCE

The purpose of the Water Plant Optimization Study (WPOS) is to document and review the present conditions and determine an optimum treatment strategy for contaminant removal at the plant, with emphasis on the removal of particulate materials and the disinfection processes.

In striving for excellence in water treatment, it is important to examine all possible approaches, but first, optimum use should be made of the processes already in place.

This optimization study is a beginning and not an end to itself; it is the start of an ongoing documentation of the operation of the plant. It is recommended that this document be updated on an annual basis.

The Ontario Ministry of the Environment has instituted a Drinking Water Surveillance Program (D.W.S.P.) consisting of a continuously updated base of information on Ontario water treatment plants and water quality. In connection with the D.W.S.P., a specific plant investigation and process evaluation study is required for each plant entering the program. The study has been prepared in accordance with a detailed protocol prepared by the Ministry of the Environment.

The Stoney Point Water Treatment Plant provides the water supply for the Township of Tilbury North, the Police Village of Stoney Point, the Police Village of Comber and parts of the Townships of Rochester and Tilbury West. The number of connections serviced in each of the municipalities is as follows:

Township of Tilbury North and Police Village of Stoney Point	-	925
Police Village of Comber	-	248
Township of Rochester	-	68
Township of Tilbury West	-	88
Total		**1,329**

The optimization study is based on plant operating data for the years 1985, 1986 and 1987.

SECTION A
RAW WATER

A.1 Source

The source of water for the Stoney Point Water Treatment Plant is Lake St. Clair. The site is located on the south shore of the Lake as shown in Figure 1. The intake structure is approximately 1,220 m (4,000 ft) offshore and water is drawn from a depth of 2.11 m (7 ft) below mean lake level, approximately 0.54 m (1.75 ft) above the lake bottom.

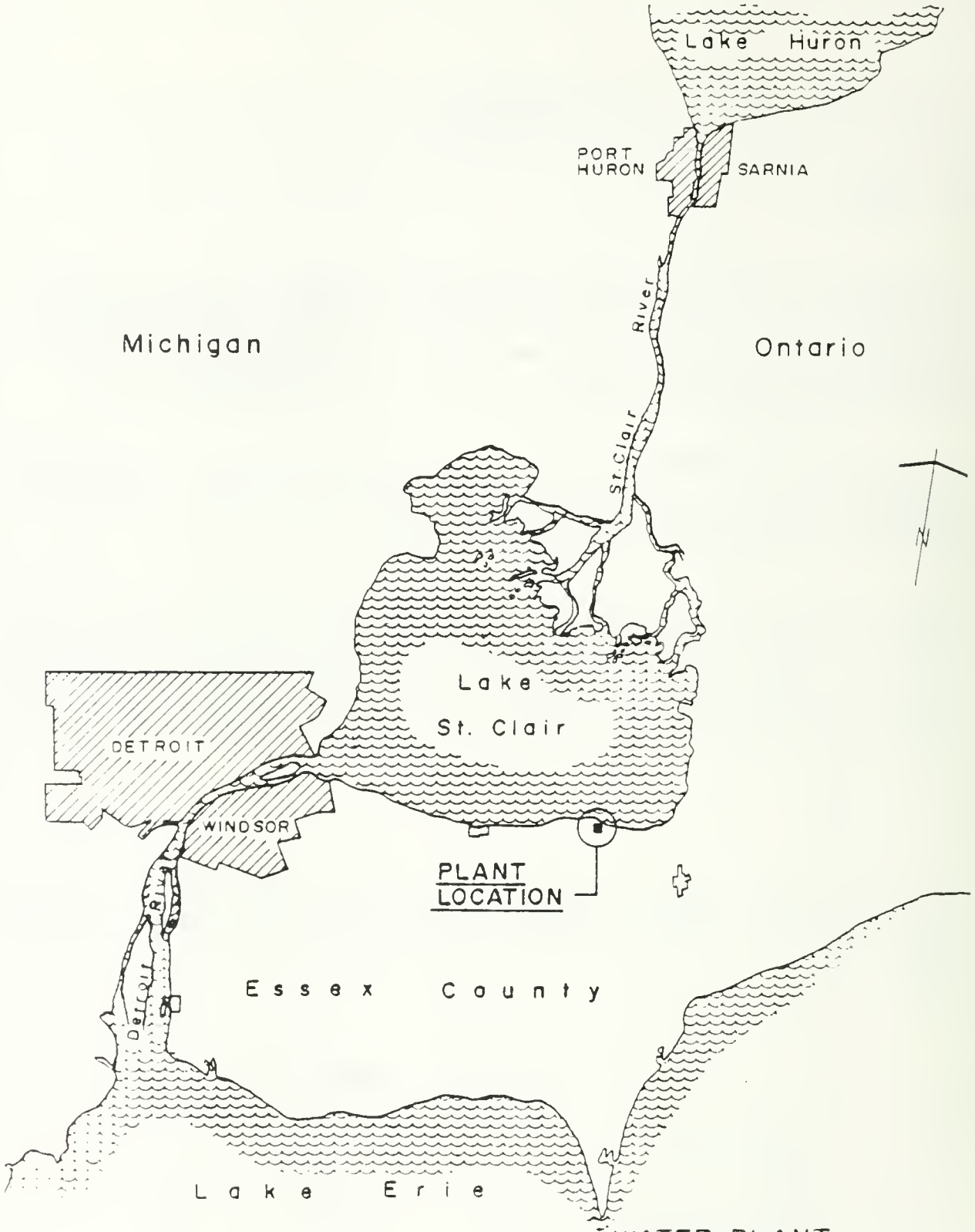
The nearest sanitary sewage treatment works is approximately 4.1 km (2.5 mi) east (upstream) of the intake where the seasonal discharge from the Township of Tilbury North oxidation ponds enters Lake St. Clair from Little Creek.

Being downstream from the industrial and agricultural areas along the St. Clair River and near the discharge of the Thames River presents the risk of raw water contamination from industrial or agricultural waste spills. Despite the potential for raw water contamination, levels of contaminants in the raw water have not exceeded Provincial Guidelines even during the period of the Dow Chemical "Blob" at Sarnia.

A.2 Quality

For 1987, raw water turbidity averaged 22 FTU, varying from a minimum of 2 FTU to a maximum of 110 FTU. Other raw water physical and chemical parameters varied as follows.

	Minimum	Maximum	Average
Colour (TW)	2	15	8
pH	8.05	8.33	8.23
Alkalinity (mg/L)	83	181	107
Hardness (mg/L)	101	247	134



WATER PLANT
OPTIMIZATION STUDY
OME Project N° 7-2028
STONEY POINT
WATER TREATMENT PLANT

LOCATION MAP

0 10 20
SCALE - KILOMETRES

Date 88 03 03

File N° WR 158 S

Figure N° 1

Although samples of raw water are submitted to the Ministry of Health Laboratory for bacteriological testing, the results are not in the form that can readily be used to summarize raw water bacteriological quality.

1986-87 Raw Water Bacteriological Analyses for Stoney Point

Total Coliforms*	Fecal Coliforms*	Fecal Strep.*
--	< 40 - < 100	--

* Organisms per 100 ml.

SECTION B
FLOW MEASUREMENT

B.1 Raw Water Flow

Raw water flow is measured by an orifice plate in the low lift pump discharge header. The differential pressure created by the orifice plate is sensed by a pneumatic differential pressure transmitter which transmits a 21 - 103 kPa (3 - 15 psi) air signal to a flow indicator/controller in the low lift pumping station control panel in the low lift pumping station. Raw water flow is also totalized.

B.2 Treated Water Flow

Only the fraction of the plant output that flows to the Police Village of Comber is metered. The meter is a 200 mm (8 in) diameter Neptune Compound Meter.

B.3 Backwash Flow

Backwash water flows are not measured. The filters are backwashed with clarified water from the high lift pumping system until the backwash wastewater runs clear as determined by visual observation of a sight glass in the piping.

B.4 Filter Flows

In 1972, orifice plates and flow control valves were installed on the discharge of the three pairs of filters in use at that time. Instrumentation was installed to provide flow indication and to allow adjusting the flow rate to each pair of filters. The instrumentation systems have become obsolete and are not repairable and the flow control systems have not been in operation for several years.

B.5 Validity of Flow Measurement

a) Raw Water Flow

The raw water flow measuring system components are approximately 24 years old and although the system is serviced on a regular basis by an

outside maintenance company, the devices are likely worn which would result in decreased accuracy of the flow measuring system.

SECTION C
PROCESS COMPONENTS

C.1 General

The plant components include the intake, coarse raw water screen, low lift pumps, solids contact upflow clarifier, settled water storage, high lift pumps and pressure filters (Figure 2). The plant has chemical system facilities for coagulation and disinfection.

Raw water flow rates are selected manually and the filtration rate varies automatically as high lift pumps are started and stopped based upon the system pressure.

Refer to Figures 3 and 4 in Appendix A for a site plan of the plant and a block schematic of the plant components.

C.2 Design Data

a) Plant Capacity

It is generally stated that the plant treatment capacity is 4.54 ML/d (1 mgd). At this flow rate, filtration rate is 4.8 m/h (1.64 gpm/sq ft) and the clarifier overflow rate is 3.22 m/h (1.1 gpm/sq ft). Total plant effluent flow is not metered and the maximum high lift flow, which is the same as the filter flow, is not known.

C.3 Process Component Inventory

a) Intake

The 600 mm (24 in) diameter asbestos bonded asphalt coated corrugated steel intake pipe is approximately 1,268 m (4,160 ft) long and extends approximately 1,220 m (4,000 ft) from shore in Lake St. Clair. The intake crib is a rock filled timber crib with a reinforced concrete top slab. The crib is 2.9 m (9.5 ft) x 2.9 m (9.5 ft) x 2.74 m (9 ft) high. It has a 1,675 mm (66 in) diameter by 600 mm (24 in) diameter bellmouth inlet connected to the

STONEY POINT WATER TREATMENT PLANT

BLOCK DIAGRAM

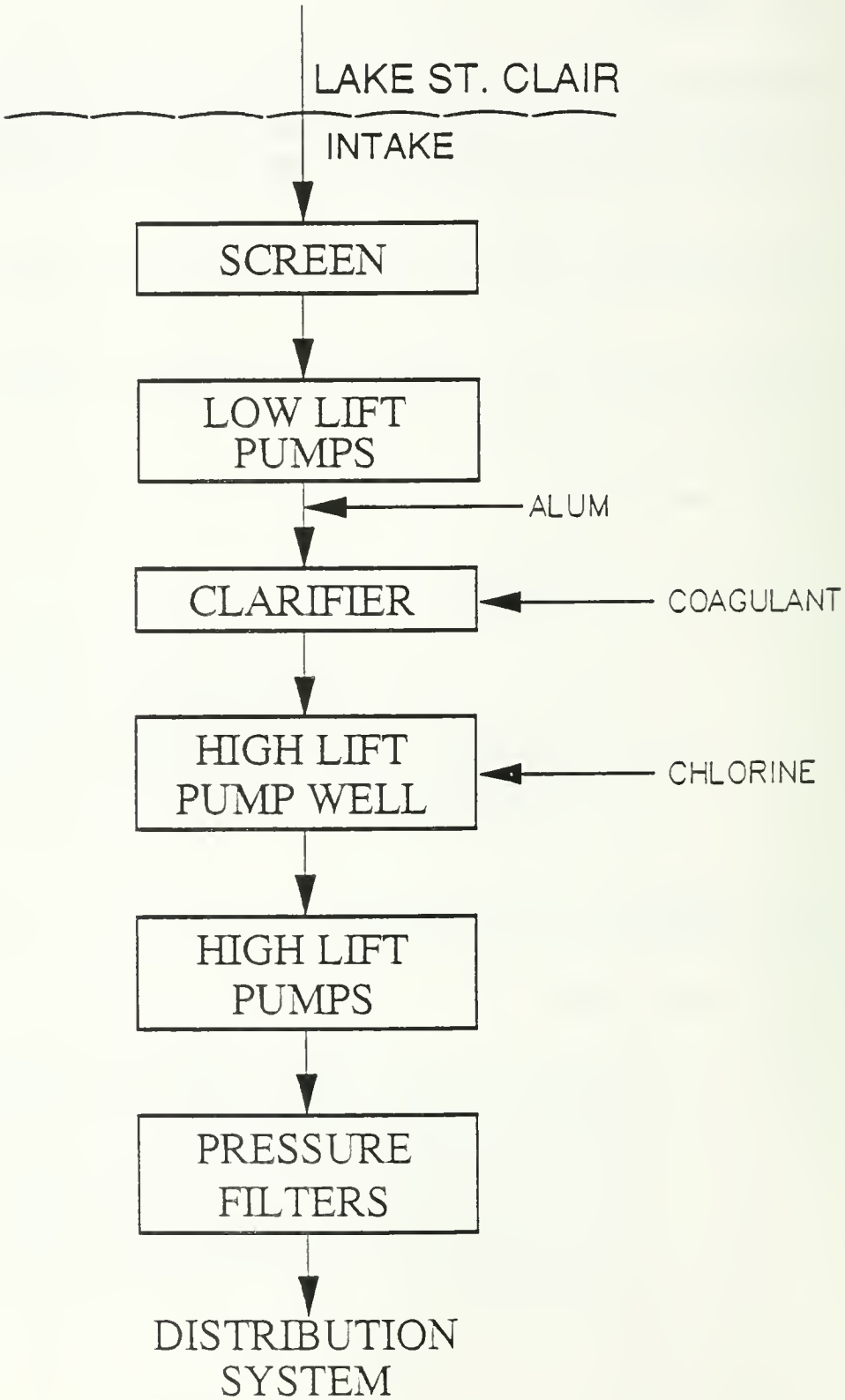


Figure Nº 2

intake pipe. Water is drawn through a 300 mm (12 in) high peripheral opening just below the top slab of the crib. The centreline of the opening is approximately 2.11 m (7 ft) below mean lake level and approximately 0.54 m (1.8 ft) above the lake bottom. The crib is surrounded by rock fill up to the bottom of the inlet opening.

The top of the intake pipe is approximately 1 m (3.3 ft) below lake bottom at the intake crib and 3.35 m (11 ft) below lake bottom at the shoreline.

The capacity of the intake is approximately 18.2 ML/d (4 mgd) at mean lake surface elevation of 175.02 metres (574.2 ft).

b) Screening

The low lift pump well entry chamber has a removable coarse bar screen 0.9 m (3 ft) wide x 6.4 m (21 ft) high with 6 mm (0.25 in) thick vertical bars spaced at 75 mm (3 in).

c) Low Lift Pumping

The low lift pumping system is comprised of two Peerless vertical turbine pumps driven by electric motors and having the following manufacturer's performance ratings:

LL-1: 3.27 ML/d (0.72 mgd) at 10.67 m (35 ft) TDH
- 7.46 kW (10 HP) motor

LL-2: 3.27 ML/d (0.72 mgd) at 10.67 m (35 ft) TDH
- 7.46 kW (10 HP) motor

The actual unrestricted pumping capability of each pump is 5 ML/d (1.1 mgd). (Figure 5)

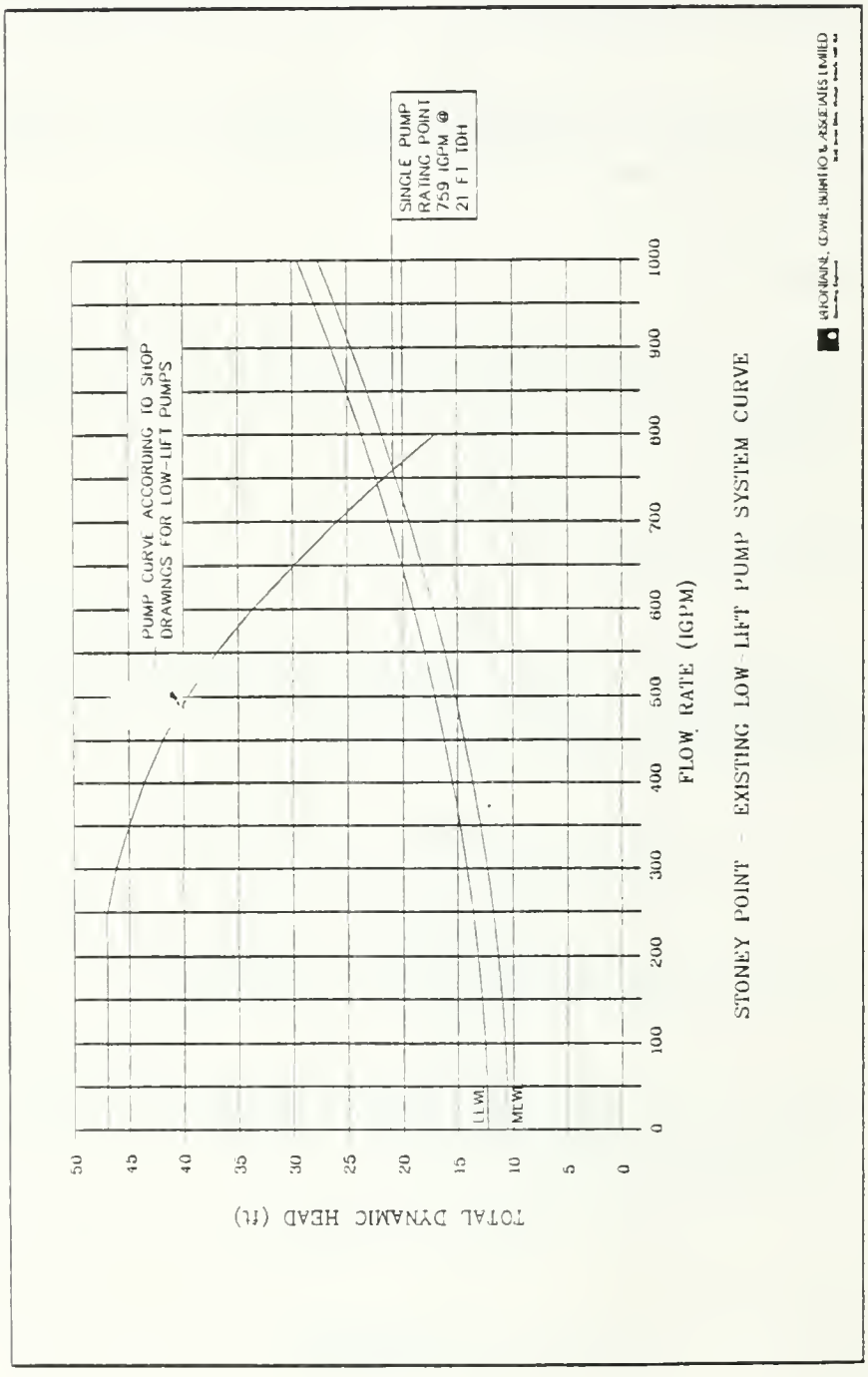
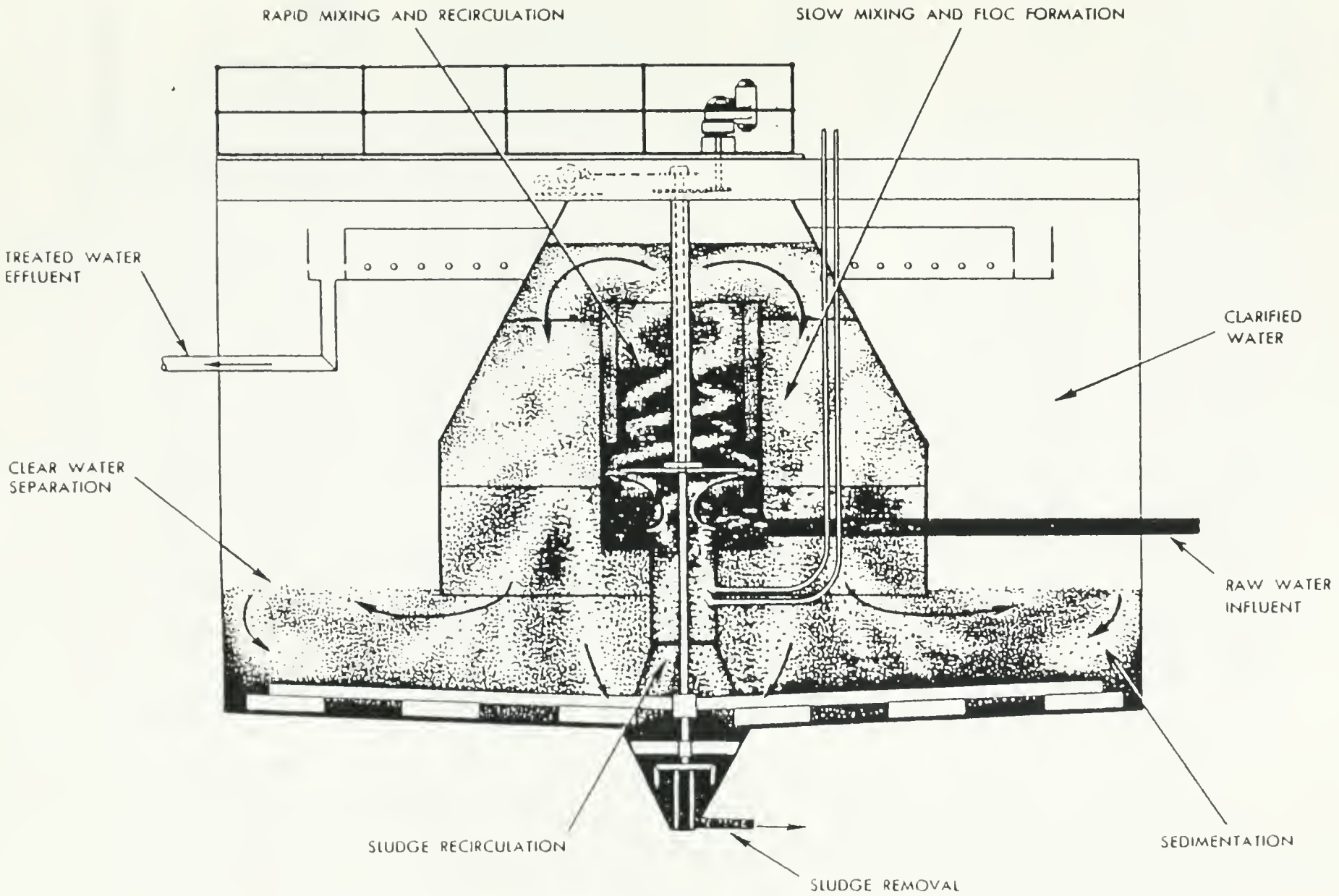

STONEY POINT - EXISTING LOW LIFT PUMP SYSTEM CURVE
TOTAL DYNAMIC HEAD (ft)
FLOW RATE (IGPM)
PUMP CURVE ACCORDING TO SHOP DRAWINGS FOR LOW-LIFT PUMPS
SINGLE PUMP RATING POINT 759 IGPM @ 21 F T TDH
LLWL
MEWL
0
100
200
300
400
500
600
700
800
900
1000
50
45
40
35
30
25
20
15
10
5
0

Figure 5



SKETCH OF
TYPICAL CLARIFIER

Figure N° 6

well structure is 6.1 m (20 ft) x 9.3 m (30.5 ft) x 4.2 m (13.8 ft) deep and has a maximum storage capacity of 208 m^3 (46,000 gal).

The plant has three vertical turbine high lift pumps having the following characteristics:

HL-1: U.S. Pumps - capacity and head unknown
- 22.4 kW (30 HP) elect. motor/gasoline engine drive

HL-2: Johnston - 1.31 ML/d (0.29 mgd) at 61 m (200 ft) T.D.H.
- 11.2 kW (15 HP) elect. motor

HL-3: Johnston - 4.6 ML/d (1 mgd) at 61 m (200 ft) T.D.H.
- 44.8 kW (60 HP) elect. motor

h) **Filters**

The plant has eight pressure filters of which only two were in operable condition during the study period.

The two operational filters are 2.44 m (8 ft) diameter by 6.1 m (20 ft) long and have pipe lateral underdrains overlain by 380 mm (15 in) of graded gravel and 760 mm (30 in) of silica sand. The average filter run time is 48 hours. The filters are backwashed with clarified water from the high lift pumping system. Since there are no operable flow measuring systems, it is not possible to determine the backwash water flow rate. It is known, however, that the maximum flow achievable is grossly inadequate. The filter media was replaced in 1987 because the existing media was contaminated with mud to such a degree that it could not be washed out.

During preparation of this report, four other pressure filters in the plant were refurbished and put into operation. They are vertical filters, two being 1.68 m (5.5 ft) diameter and the other two 1.83 m (6 ft) diameter.

With the six filters in operation at a plant flow rate of 4.54 ML/d (1 mgd), the filtration rate would be 4.8 m/h (1.64 gpm/sq ft).

The other two filters are installed outdoors and require extensive repairs.

i) Storage

The waterworks system has no storage facilities for treated water except for a 2.4 m (8 ft) diameter by 5.5 m (18 ft) long hydro-pneumatic tank. This tank was installed when the original plant was constructed and flow rates were very low. At present flow rates, it is too small to have any significant benefit.

j) Backwash Treatment and Sludge Disposal

Filter backwash wastewater and clarifier sludge are discharged without treatment to the lake at the shoreline.

C.4 Chemical Systems

a) Disinfection

Only post-chlorination is practised at the plant. The chlorination system utilizes liquid chlorine stored in 68.2 kg (150 lb) cylinders and a Wallace & Tiernan Model A-731, V-notch chlorinator with a 0-9.1 kg/d (0-20 lb/d) rotameter. Two chlorine cylinders are placed on a 2 - cylinder scale which indicate the weight of each cylinder separately. Standby chlorination is accomplished with an Advance Model 30 chlorinator with a 0 - 4.55 kg/a (0 - 10 lb/a) per day rotameter. The standby chlorinator is not permanently installed and must be connected to the system before it can be used. Ejectors are used to produce a chlorine/water solution which is added through diffusers at the inlet end of the high lift pump well. Chlorine feed rate is adjusted to maintain a free chlorine residual of 1.0 - 1.5 mg/L in the plant effluent.

b) Coagulant

Granular alum is used as a coagulant in conjunction with a Wallace & Tiernan Model A690 volumetric feeder and solution tank located in the building above the clarifier. The alum solution discharges to the water surface in the centre area of the clarifier.

c) Coagulant Aid

Because of treatment problems early in 1988, a temporary coagulant aid mixing and feed facility (polyethylene tank with mixer and a Wallace & Tiernan A-747 metering pump) was installed in the low lift pump house. Use of Alchem 86070 polymer in a 0.1% solution at a dosage of 2 mg/L made a significant improvement in treatment capability.

C.5 Sampling

The plant has no special features or facilities for sampling water at various stages of treatment. Details of the sampling and testing program are given in Table 9.

C.6 Automatic Operation

Automatic operation is provided for the following:

- Low lift pump shutdown on low water level in the pump well.
- Clarifier sludge blow down for a timed period after a selected raw water flow volume has passed through the clarifier.
- Timed sequence for alum feeder operation based on volume of raw water flow.
- Automatic low lift pump discharge flow control to maintain a water surface elevation in the high lift pump well.
- High lift pump sequencing based on system pressure.

C.7 Standby

The plant has a 25 kW diesel generator set which can provide sufficient power to operate the low lift pumps.

Standby high lift pumping is provided by a gasoline engine drive on High Lift Pump HL-1.

C.8 Photographs

Following are photographs of the plant and its components.

TABLE 9

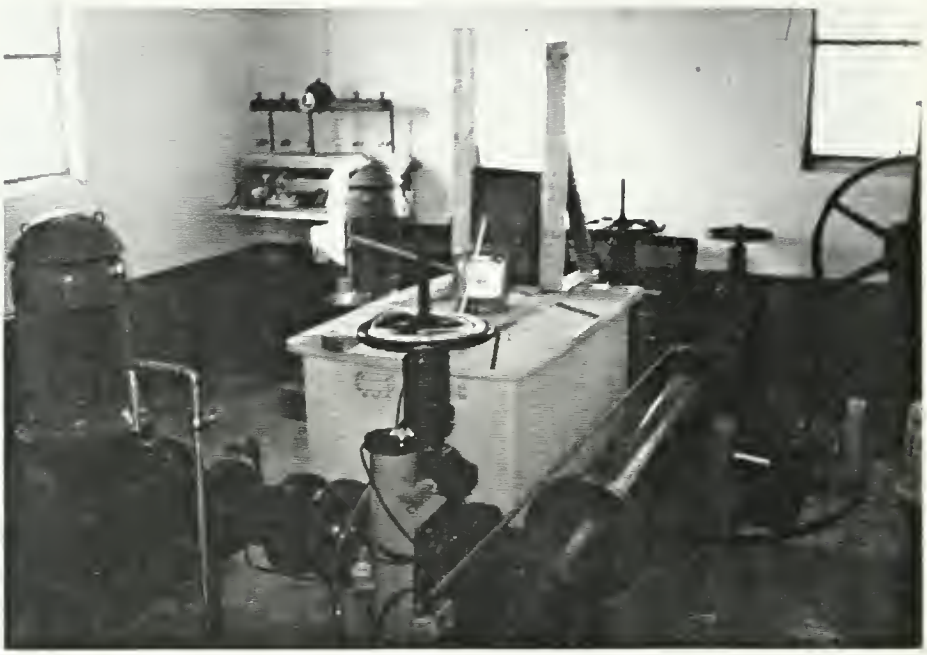
SAMPLING AND TESTING SUMMARY

STONEY POINT WATER TREATMENT PLANT

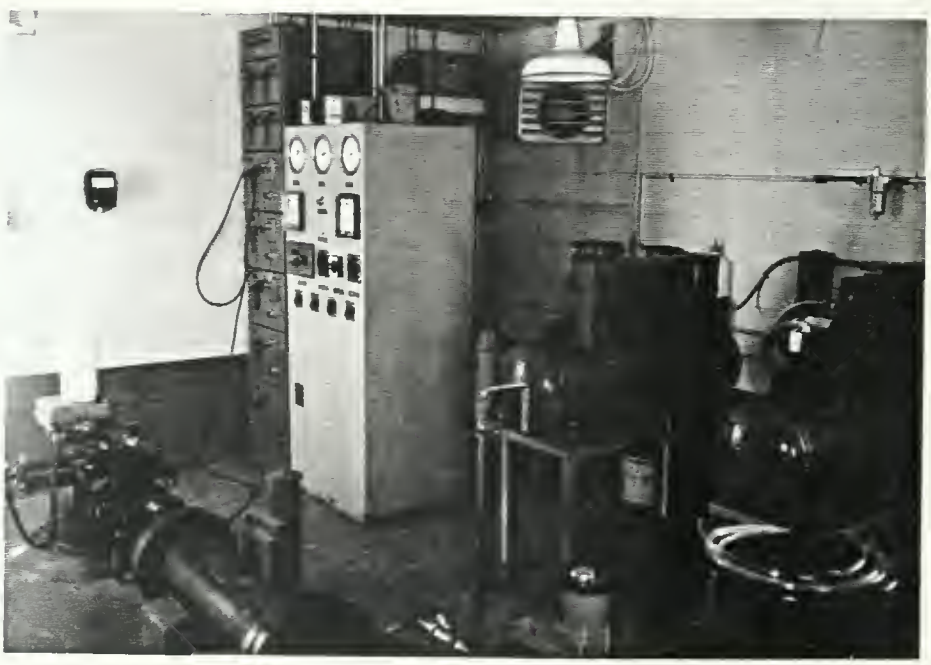
TEST	CHEMICAL APPLICATION POINT	SAMPLING POINT	TESTING FREQUENCY	RECORDING FREQUENCY	TESTING INSTRUMENT
Raw Water Turbidity	-	Low Lift Pump Discharge	Once/day	Once/day	Hach-Model 18900 Ratio Turbidimeter
Plant Effluent Turbidity	-	Plant Discharge (Lab Sink Tap)	3 times/day	Once/day	Hach-Madel 18900 Ratio Turbidimeter
Post-chlorination Residual	High Lift Well Inlet	Plant Discharge (Lab Sink Tap)	5 times/day	5 times/day	Hach dr/2 Spectrophotometer
pH	-	Plant Discharge (Lab Sink Tap)	Once/day	Once/day	Hach dr/2 Spectrophotometer

View of clarifier and Low Lift Pumping Station looking north. Lake St. Clair in background.

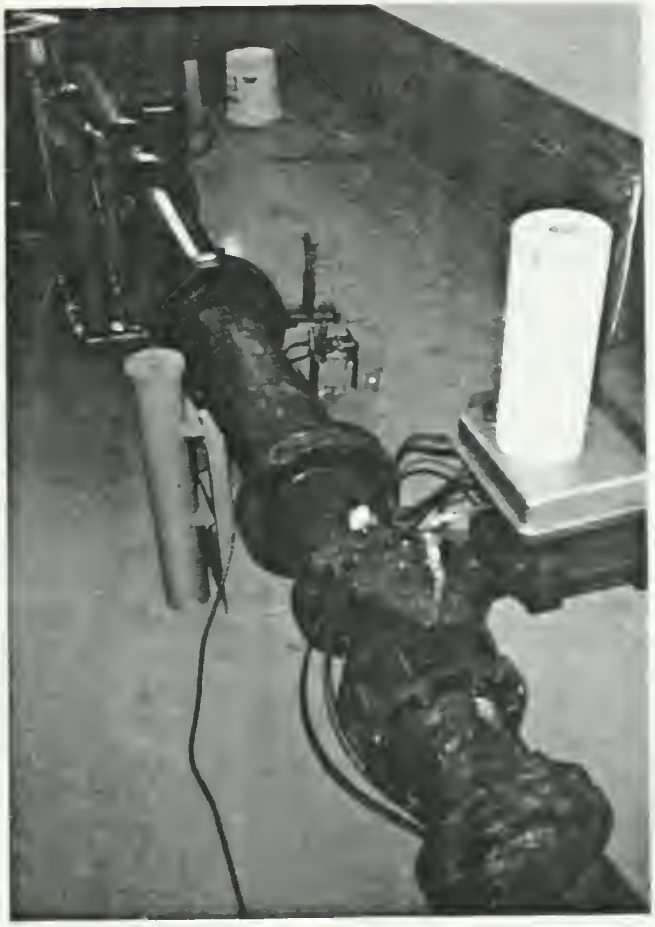
South elevation of Low Lift Pumping Station.



Low Lift Pumping Station showing pumps and piping. Temporary coagulant aid system in centre of photograph.



Low Lift Pumping Station. Motor control centre, control panel and air compressors for instrument air system.



Low lift discharge pipe. Air cylinder operated butterfly valve in foreground. Orifice plate and D/P cell - upper left.

Low lift pump system control panel.

Clarifier showing clarifier cover.

Clarifier building. Effluent chamber in centre foreground.

Interior of clarifier building showing clarifier drive mechanism and alum feeder.

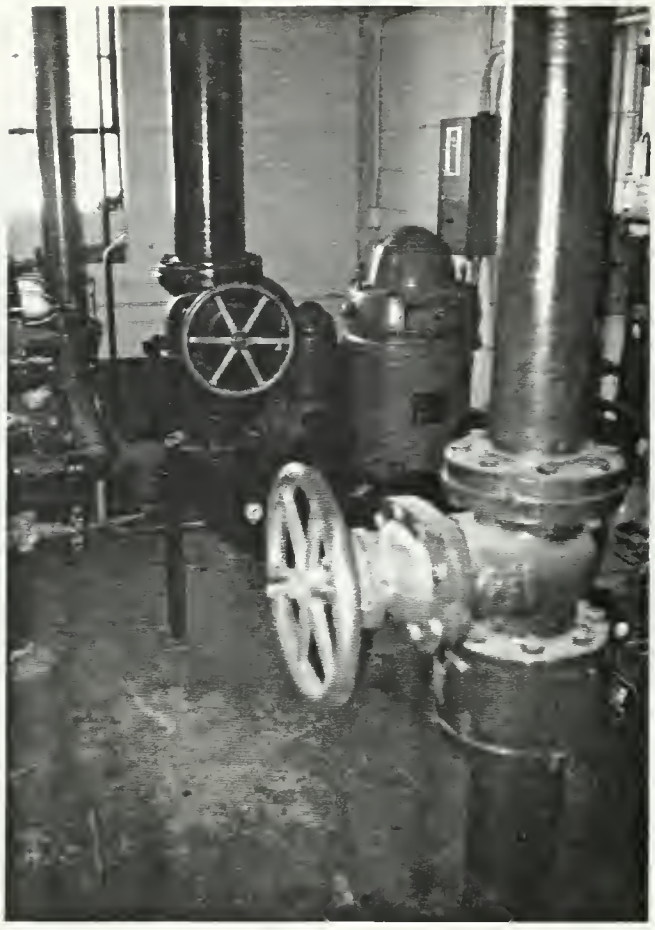
Alum feeder in clarifier building.

North elevation of plant.

East elevation of plant.

View looking west showing outside filters.

High Lift Pump HL-2 in foreground, High Lift Pump HL-1 with electric motor/diesel engine drive in background.

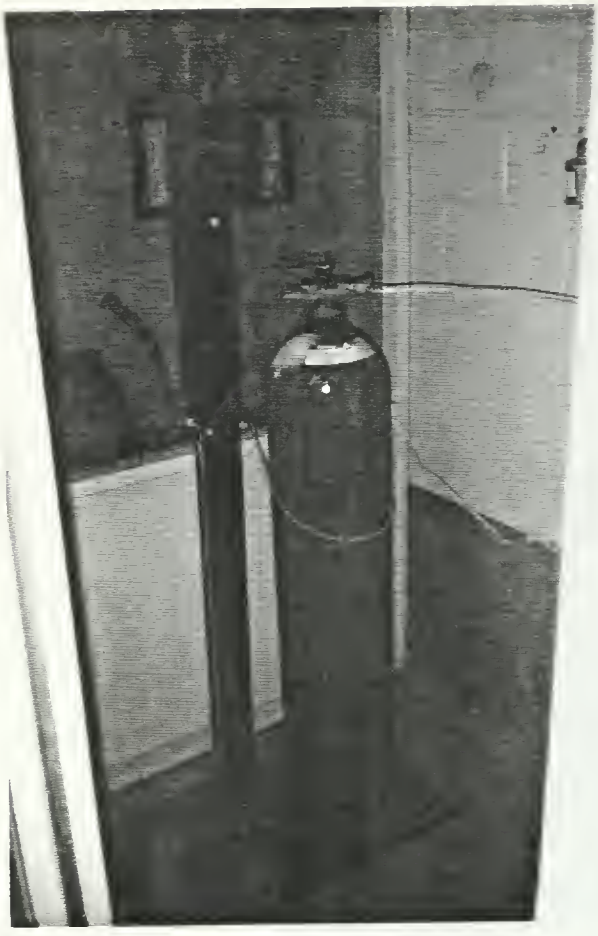


High Lift Pump HL-3 in centre right.

Filter piping.

Filter piping.

South end of filter.



Chlorine cylinder scales.

Chlorinator

Chlorinator and chlorine solution piping.

Diesel engine generator.

Workshop area. Office in centre right.

SECTION D
PLANT OPERATION

D.1 General Description

The original plant was constructed in 1956 and the system was comprised of a 300 mm (12 in) diameter intake extending approximately 305 m (1,000 ft) beyond the present shoreline, a flocculation/settling basin, four vertical pressure filters, high lift pumps and coagulant and chemical feed systems. The system was constructed along with a water distribution system to service approximately 350 consumers.

In 1960 the plant was expanded and two additional pressure filters, 2.44 m (8 ft) diameter by 6.1 m (20 ft) long were installed. Low water levels in Lake St. Clair during the early 1960's resulted in the water's edge receding to a point somewhat beyond the intake structure. A trench had to be excavated outwards from the intake structure to allow lake water to flow to the intake structure.

In 1965 a new intake, low lift pumping station and solids contact upflow clarifier were constructed.

Over the years, the water distribution system has grown to the extent that at the present time, approximately 1,329 customers are serviced by the plant.

The water treatment plant staff consists of a superintendent and an assistant superintendent. In addition to operating and maintaining the water treatment plant, the staff has the responsibility for the water distribution systems in the Townships of Tilbury North and Tilbury West. Normal working hours on weekdays are 7:30 a.m. to 4:00 p.m. The staff is not at the plant between 4:00 p.m. and 7:30 a.m. On weekends one of the staff members visits the plant for approximately one hour at 8:00 a.m. and 5:00 p.m. On weekdays the superintendent is at the plant approximately 75% of the time and the assistant 40% of the time.

The plant does not have an alarm system to alert plant staff of any abnormalities that might occur during non-working hours.

D.2 Flow Control

The high lift pumps are controlled automatically depending on the pressure in the distribution system and plant effluent flow is dependent on which high lift pumps are running. In 1972, flow indicating and control devices were installed on the outlet piping of each pair of filters. These systems have not been in operation for a number of years and the operator advises the instruments cannot be repaired.

Raw water flow is measured by an orifice plate in the low lift pump discharge header. Instrumentation was originally provided to automatically adjust the position of a butterfly control valve in the low lift pump discharge header to maintain a preset water level in the high lift pump well. A low level signal would automatically start the second low lift pump and the pumps would stop on a high level signal. The water plant superintendent indicates the selector switches for both low lift pumps are kept in the "auto" position and in most cases only one low lift pump is required to meet demand. The superintendent indicates a high level signal occurs regularly and stops low lift pumping. It would appear the control system is not operating as designed since the set point control system should minimize interruptions in low lift flow.

D.3 Disinfection Practices

Disinfection is accomplished by the use of chlorine. Liquid chlorine is stored in 68.2 kg (150 lb) cylinders and is put into the solution with water through the use of gas chlorinators and ejectors. The plant has two chlorinators, one for normal operation, the other for standby. Chlorine solution is added to the clarifier effluent at the inlet end of both halves of the high lift pump suction well with the objective of having a 1.0 - 1.5 mg/L free chlorine residual in the plant effluent. Maximum dosage rate is 2 mg/L at 4.54 ML/d (1 mgd) flow rate.

Chlorine feed rates are set manually and adjusted, when required, to correct for deviations from the objective residual. The plant effluent is sampled and tested for chlorine residual five times per day.

Chlorine dosage is determined daily based on the weight of chlorine used and the daily raw water flow.

D.4 Operation of Specific Components

a) Intake

Raw water flows into the intake crib through a 300 mm (12 in) high opening around the periphery of the 2.9 m (9.5 ft) by 2.9 m (9.5 ft) crib. The opening is 2.11 m (7 ft) below mean lake level and approximately 0.54 m (1.8 ft) above lake bottom. The crib is approximately 1,220 m (4,000 ft) from shore and water flows to the low lift pumping station through a 600 mm (24 in) dia. intake pipe. The plant superintendent indicates that although frazil ice has not caused an intake blockage problem, needle ice has been observed in the low lift pump well inlet chamber.

b) Screening

The low lift pump well inlet has a 0.9 m (3 ft) wide by 6.4 m (21 ft) high bar screen with vertical bars spaced at 75 mm (3 in). The screen is cleaned every two years and very little accumulation of debris is evident. Screenings are disposed of in the lake.

c) Low Lift System

The low lift pump well is emptied and cleaned every two years. The silt build-up, approximately 600 mm (24 in) deep in the corners, is loosened with a water stream and pumped to the lake.

The low lift pumping system is comprised of two 3.27 ML/d (0.72 mgd) vertical turbine pumps driven by constant speed electric motors. As originally installed, the low lift pumping system was provided with an automatic control system. With the pumps in automatic, a flow indicator/controller, which received a signal from the differential pressure transmitter connected to an orifice plate in the low lift pump discharge header, operated under set point control. The set point was derived from the water level in the clarifier effluent chamber which is essentially the same as the water surface elevation in the high lift pump well. This system should

produce a relatively uniform flow through the clarifier. However, the plant superintendent indicates the low lift pumps frequently shut on high level in the clarifier effluent chamber. It would appear the control system is not operating properly. Normally, only one low lift pump is on but if the level in the clarifier effluent chamber is low, the second pump will start automatically. The duty pump is alternated weekly.

d) e) f) **Clarification (Coagulation, Flocculation and Sedimentation)**

Clarification is accomplished in a 9.14 m (30 ft) diameter by 3.96 m (13 ft) sidewater depth reinforced concrete tank with Graver solids contact upflow clarifier internals. (Figure 6)

Granular alum is used as a coagulant. The granular alum is mixed with water and fed to the surface of the centre section of the clarifier. Originally, alum solution was fed to the clarifier inlet pipe but the alum feed pipe corroded and has been broken off. Alum is not fed on a continuous basis. The feed system is activated for a selectable time after a specified volume of raw water has been pumped. A typical winter setting would be to operate the alum feeder for 90 seconds after 14 m^3 (3,000 gpd) of raw water have been pumped to the clarifier.

The clarifier sludge blow down system was designed such that a pump, directly connected to the sludge blow down pipe, would operate for a selected time after a specified volume of raw water had been treated in the clarifier. A pump was used because the bottom of the clarifier is below lake level and gravity drainage was not possible. The plant superintendent indicates that the sludge removal pump has been inoperable for the last 3 years and sludge is removed by connecting a portable gasoline engine driven pump to the sludge blow down pipe. During winter, sludge is removed once a week for approximately 5 minutes, and 3 times per week for 15 - 20 minutes during the summer. The capacity of the pump is not known and, therefore, the volumes of sludge removed cannot be determined.

In the original system a pump installed in the building above the clarifier had its suction connected to a manifold which would allow obtaining samples of liquid from various locations in the clarifier. The system has been inoperable for quite some time and as a result, conditions in the clarifier are not used to regulate operation of the clarifier. The decision to remove sludge is made by visually observing the sludge blanket elevation from the top of the clarifier.

Coagulant dosages are mainly adjusted based on the operator's past experience. The plant staff carries out jar tests to determine coagulant dosage when raw water turbidity changes drastically. The clarifier turbine speed is adjusted only once or twice a year, usually in the Spring and Fall.

The clarifier is covered which eliminates problems caused by wind action. In extremely cold periods, a small space heater is placed under the cover which keeps the clarifier free of ice.

In 1982 the clarifier internals were sand blasted and painted for the first time since the equipment was installed in 1965. Corrosion was so severe in some locations, that sand blasting punched holes through the steel plates and the bottom conical inlet to the draft tube had to be completely rebuilt. Before the work was done, corrosion had caused holes to develop in the detention cone where it formed one wall of the central settled water collection launder which allowed clarifier solids to escape into the effluent.

g) Filters

The plant has 8 filters which operate in pairs. Two of the filters are outdoors and were previously used for peak flows during the summer. These filters are in a dilapidated state of repair and are not operable. During the study period, only the two 2.44 m (8 ft) diameter by 6.1 m (20 ft) long horizontal filters were in service. The remaining two pairs of filters were in a poor state of repair and not used. These filters have been refurbished recently and put into operation. The flow through the filters is governed by the discharge of the high lift pumps.

In 1987 the filter media was found to be severely contaminated with mud which could not be washed out and the media was removed and replaced. The filters have pipe lateral underdrains and have a 380 mm (15 in) thickness of graded gravel and 760 mm (30 in) of silica sand. One filter is backwashed every day except sometimes during the winter when filters are not backwashed on weekends. Clarified water from the high lift pump discharge is used for filter backwashing. Although the backwash water flow rate is not known it is grossly inadequate. When a filter is being backwashed, the other one continues to filter with possible turbidity breakthrough.

Following is a brief description of backwash procedure:

- Close filter effluent valve.
- Open backwash water valve.
- Close filter inlet valve.
- Open backwash wastewater valve slowly,
- Turn off high lift pump HL-1 and turn on high lift pump HL-3 (HL-3 is the highest capacity pump and it is used during backwashing to achieve the highest possible backwash water flow).
- Continue washing for 20 to 25 minutes until backwash wastewater clears as visually determined by observing the backwash wastewater through a site glass in the piping.
- Start high lift pump HL-1 and stop high lift pump HL-3.
- Close backwash wastewater valve slowly in stages.
- Open filter inlet valve.
- Close backwash valve.
- Open filter - to - drain valve.
- Filter to drain for approximately 2 hours.
- Close filter - to - drain valve.
- Open filter effluent valve.

h) High Lift Pumping

The three High Lift Pumps pump clarifier effluent through the pressure filters. The pumps operate automatically in accordance with the system pressure as follows:

HL-1: On at 380 kPa (55 psi), Off at 517 kPa (75 psi)
HL-2: On at 414 kPa (60 psi), Off at 552 kPa (80 psi)
HL-3: On at 276 kPa (40 psi), Off at 414 kPa (60 psi)

There is no elevated storage and continuous pumping is required to maintain pressure on the system.

High lift pump HL-2 is on most of the time. The pressure settings are adjusted such that during the summer the maximum system pressure is 655 kPa (95 psi) and 517 kPa (80 psi) during the winter.

A hydro-pneumatic tank connected to the plant discharge piping was originally intended to maintain system pressure when pumps would stop during low flow periods. Because of increased flows, the hydro-pneumatic tank has little value.

D.5 Chemicals

a) Coagulant

The alum storage and feed system is located in the clarifier building. Alum is received and stored in granular form in 45.45 kg (100 lb) bags. A Wallace & Tiernan Model A-690 volumetric dry chemical feeder with storage hopper is mounted on a mixing tank. Granular alum is fed to the solution tank by a screw feeder at the bottom of the storage hopper. The solution tank has a mixer and a continuous inflow of water. Alum solution discharges from the mixing tank by gravity and is fed to the surface of the centre section of the clarifier. Every day plant staff fills the hopper to the same level and weighs the amount of added alum. From the weight of alum required to charge

the hopper and the total raw water flow, the previous day's alum dosage is calculated.

The chemical feeder originally had a mechanism for adjusting the feed rate of granular alum to the solution tank. The mechanism has been removed and it is no longer possible to adjust the screw feeder. The screw feeder operates intermittently for a preset time after a preset volume of raw water has been pumped. The alum feeder is interlocked with the low lift pump motors to allow it to operate only if a low lift pump is running.

b) Chlorination

Chlorine solution is added through diffusers at the inlet end of both sections of the high lift pump well. Chlorine dosage is adjusted manually in response to the results of chlorine residual tests to maintain 1.0 - 1.5 mg/L free chlorine residual in the plant effluent. The plant has no automatic facility for adjusting the chlorine feed rate in proportion to the high lift pump discharge.

Average daily chlorine dosage is calculated from the weight of chlorine used and the daily raw water flow.

D.6 Sampling and Data Collection

Table 9 summarizes the testing and data recording procedures in the plant. Water samples are collected on a weekly basis and sent to the Ministry of Health Laboratory in Windsor for bacteriological testing as follows:

One Sample - Raw Water
One Sample - Plant Effluent
Two Samples - From Distribution System

D.7 Alarms

The plant has no alarm system.

D.8 Operator Duties and Plant Maintenance

The plant does not have a written operating manual.

Every morning the following tasks are undertaken:

- Record Comber Waterline meter reading.
- Measure raw water and plant effluent turbidity.
- Measure plant effluent chlorine residual.
- Adjust chlorine dosage as required.
- Charge alum hopper.
- Record raw water flow totalizer reading.
- Blow water out of compressors.
- Check equipment to ensure proper operation.
- Backwash filters if necessary.
- Record chlorine cylinder scale readings.
- Calculate previous day's alum and chlorine dosages.

Plant effluent chlorine residual is tested at 2 hour intervals between 7:30 a.m. and 4:00 p.m. and chlorine feed rate adjusted as required.

No plant checks are made between 4:00 p.m. and 7:30 a.m. on weekdays. On weekends, the plant superintendent or his assistant will visit the plant at 8:00 a.m. and 5:00 p.m. and spend approximately one hour testing for chlorine residual and turbidity and making adjustments to chemical feed rates as required.

D.9 Standby

The plant has a diesel engine generator which can supply emergency power to the low lift pumping station. Emergency high lift pumping is achieved by the gasoline engine drive on high lift pump HL-1.

There are no provisions for automatically starting standby facilities. Because there are no external alarms, a power failure at the plant after hours goes unnoticed until customer complaints of no water pressure reach the plant staff.

SECTION E
PLANT PERFORMANCE

E.1 Particulate Removal

The plant turbidity measuring equipment failed sometime prior to the study period and was not repaired or replaced until May 1986. From June 1, 1986 on, raw and treated water tests were recorded.

For 1987, raw water turbidity averaged 22 FTU, ranging from a minimum of 2 FTU to a maximum of 110 FTU.

The following table gives the distribution of raw water turbidity:

Raw Water Turbidity (1987)

Turbidity (FTU) Equal to or less than	Percent of time
110	100
40	90
30	81
25	72
20	61
15	47
10	26
5	9

The turbidity is considerably less than for other plants with intakes in Lake St. Clair and may be attributed to a longer intake and deeper water at the crib at Stoney Point.

Since clarifier effluent turbidity records are not available, it is not possible to evaluate clarifier effectiveness. For 1987 coagulant dosages were:

Minimum	-	5 mg/L
Maximum	-	100 mg/L
Average	-	32.4 mg/L

During 1987, treated water turbidities were:

Minimum	-	0.06 FTU
Maximum	-	4.70 FTU
Average	-	0.47 FTU

Distribution of treated water turbidities is given in the following table.

Treated Water Turbidity (1987)

Turbidity (FTU) equal to or less than	**Percent of time**
4.70	100
1.00	97
0.90	83
0.80	82
0.70	80
0.60	79
0.50	75
0.40	65
0.30	52
0.20	27
0.10	5

Treated water turbidity exceeded the Ontario Drinking Water Objective of 1 FTU on 10 days during 1987. On 30 additional days treated water turbidity was recorded as 1.00 FTU. A review of the operating data generally indicates high treated water turbidity during periods of cold water and higher raw water turbidities. There are also some instances of high treated water turbidity when raw water turbidity was very low, mainly when raw water temperature was low.

Recognizing that the filter backwash water facilities are inadequate, it will be necessary to ensure the clarifier is operating as effectively as possible to reduce treated water turbidity especially during cold weather.

E.2 Disinfection

Plant practice is to chlorinate the clarifier effluent to maintain a 1.5 mg/L free chlorine residual in the plant effluent.

During the study period, free chlorine residual in the plant effluent varied from 0.50 mg/L to 1.70 mg/L. Chlorine dosage rates varied from 0.69 mg/L to 5.99 mg/L. The rather wide range can probably be accounted for by the inability of the system to automatically compensate for changes in raw water flow and increased chlorine demand when clarifier effluent turbidity becomes higher between residual tests.

The minimum dosage rate is lower than the objective residual. Table 3.1 Disinfection Profile indicates chlorine dosages lower than the residual in the treated water. This can probably be explained by the fact that chlorine dosage is calculated on the basis of raw water flow with no allowance made for clarifier sludge blowdown. It could also be an indication of inaccuracy in the raw water flow measuring system.

Bacteriological testing is carried out at the Ministry of Health Laboratory in Windsor and the test results are not summarized at the plant. The plant superintendent indicates he receives occasional notification of positive test results from the MOH. When this occurs additional samples are collected and tested. The plant superintendent advises there has not been any indication of improper disinfection at the plant.

SECTION F
RECOMMENDATIONS

The Township of Tilbury North has undertaken to modify and expand the Stoney Point Water Treatment Plant. Final design is in progress and it is anticipated the new works will be in operation in late 1989.

The project will generally include the following:

- Flow measurement systems.
- Liquid coagulant storage and feed system.
- Coagulant aid storage and feed system.
- Gravity filters.
- Filter feed pumps.
- Treated water storage.
- High lift pumps.
- Backwash water pump.
- Diesel engine generator.
- Fluoridation storage and feed system.
- Renovations to existing building to provide a new chlorine room, office, lunchroom and washroom.
- Replacement of obsolete and/or inadequate equipment.

The following recommendations are made bearing in mind that the existing plant will be required to operate for only a short time. Recommended new equipment will be incorporated into the new plant.

.1 Plant Staffing, Testing and Record Keeping

The water treatment plant is manned for only 20% of the time. This limited time restricts the plant staff's ability to perform tests, keep proper records, monitor the effectiveness of treatment, carry out preventive maintenance on the equipment and perform general housekeeping duties. It would be almost impossible to evaluate the effectiveness of trials of alternative

coagulants, use of filter coagulant aid or other process modifications with the present staffing arrangement.

Drinking water quality has become a newsworthy item at late and increased public awareness and pressure will probably result in a demand for better water quality standards and greater accountability of waterworks staff and management.

It is recommended that consideration be given to increasing plant staff to ensure the continuous supply of acceptable quality water. In addition, testing and record keeping procedures should be reviewed and modified to include clarifier effluent turbidity and filter effluent turbidity and more frequent testing and recording of raw water turbidity and plant effluent turbidity. Aluminium residuals should be tested at the plant and used as an operating tool. In addition, chlorine residual data should be reconciled prior to reporting.

It is suggested that the Ministry of the Environment Utility Monitoring System forms be used for summarizing present operating data.

To obtain a better understanding of bacteriological water quality, it is recommended that duplicate bacteriological samples should be sent to the London MOE lab for analysis on a monthly basis. The Ministry of Health lab does not conduct total coliform analyses. Additionally a bacteriological record keeping system should be initiated.

.2 Low Lift Pump Control System

The low lift pump control system operates such that there are frequent stoppages in raw water flow to the clarifier which is not good practice. The control system was designed to provide a more continuous raw water flow.

It is recommended that the low lift control system be examined to determine if the original control can be established without costly equipment replacement.

.3 Clarifier Sludge Blowdown System

The present practice of removing large quantities of sludge at infrequent intervals probably results in decreased clarifier efficiency.

It is recommended that the sludge removal pump be repaired or replaced and sludge be removed for shorter periods of time at more frequent intervals.

The sludge sampling system should be reinstated. A comprehensive sludge sampling program should be designed and instituted.

.4 Alum Feed System

The alum feed system is dilapidated and will be replaced when the plant is modified. In the meantime, some work should be done to improve the system.

It is recommended that the alum feed piping to the clarifier inlet pipe be re-installed and that the feed system be adjusted to feed alum solution as continuously as possible.

.5 Turbidity Measurement

At the present time, only raw water and plant effluent turbidity test results are recorded. Raw water turbidity is normally tested and recorded once a day and plant effluent turbidity three times a day. Since the plant is unattended for parts of the day, at night and on weekends, turbidity monitoring equipment should be installed to ensure proper operation of the plant.

It is recommended that the following turbidity monitoring equipment be acquired:

Filter Effluent - Continuous flow turbidimeters with indicators and alarm points on the filter effluent from each pair of filters.

Clarifier Effluent - Continuous flow turbidimeter with indicator and alarm points.

Raw Water - Continuous flow turbidimeter with indicator and alarm points.

.6 Filters

It is recommended that an in-plant study be conducted to determine the time filtering-to-waste should last following filter backwashing to ensure that all backwash water has been displaced before putting the filter into service.

.7 Chlorine Residual Analyzer

A chlorination system failure would result in the almost immediate discharge of non-disinfected water to the distribution system.

It is recommended that a chlorine residual analyzer/recorder with alarm points be installed to monitor plant effluent chlorine residual. The recent reactivation of Filters 3, 4, 5 and 6 will present a problem in obtaining plant effluent sample because the discharge piping from these filters is connected to the distribution system separately from the discharge from Filters 1 and 2. It will, therefore, be necessary to pipe samples of effluent from each pair of filters to the chlorine analyzer/recorder and ensure a sample stream from operating filters is discharged to it.

.8 External Alarm

At the present time there is no system to alert the plant staff of any malfunctions at the plant when it is unattended.

It is recommended that an extensive alarm system be installed for:

1. Clarifier effluent turbidity high.
2. Filter effluent turbidity high.
3. Chlorine residual low.
4. Plant discharge pressure low.
5. Intrusion

.9 Entrained Air (Water Distribution System)

On occasion entrained air will cause the water to appear milky.

It is recommended that this phenomenon be investigated.

.10 Operating Manual

It is recommended that a plant operating manual be written.

.11 Plant Security

Due to the unmanned nature of the plant, perimeter fencing should be considered.

APPENDIX A

Figure No. 3 - Site Plan

Figure No. 4 - Block Schematic

APPENDIX B

Plant Log Sheets

DAILY CHECK

HIGH LIFT BUILDING

Operator _____ Time _____ Date _____

Chlorine Residual _____ Feed _____ Weight _____

Comber Line Reading: High _____ Low _____

Pumos Oil Level

	O.K.	ADD
A-1		
A-2		
A-3		

Compressor

CLARIFIER BUILDING

Sludge Sample Reading: _____ Alum Weight _____

Water Supply: _____ Alum Feeder _____ O.K.

Shear Pin:- _____ O.K. _____ Needs Cleaning

_____ Sheared

LOW LIFT BUILDING

Counter Reading _____

Timers: Sludge _____ Alum: _____

Switch Pumps: From: _____ To: _____

Flow Readings: Pump No. 1 _____

Pump No. 2 _____

Blow Out Compressor: _____

Approved _____

MONTH OF _____, 19__

Date	P.H.	CHLORINE Residue	CHLORINE Per Day	TURBIDITY T	TURBIDITY R	ALUM Time	ALUM Lbs Per Day	BLACK WASH	COUNTER READING X 100	PUMPAGE	REM
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											
26											
27											
28											
29											
30											
31											

DAILY PUMPAGE AVERAGE .....

TOTAL MONTH PUMPAGE .....

FILTER RUN AVERAGE .....

ALUM MONTH TOTAL "LBS" .....

SODIUM SILICATE MTH TOTAL/LBS .....

CHLORINE MONTH TOTAL "LBS" .....

REMARKS .....

Pre Chlorine | Post Chlorine

Days	No. of lbs	No. of lbs. used	Feed Rate	No. of lbs	No. of lbs. used	Feed Rate

Month ______________

CHLORINE RESIDUAL

MONTH ______________

DAY	7:30	10:00	12:30	2:00	4:00	

APPENDIX C

DATA TABLES

WATER PLANT OPTIMIZATION STUDY
STONEY POINT WATER TREATMENT PLANT

TABLE 1.0: FLOWS (ML/d)

		1987			1986			1985		
		MAX.	MIN.	AVG.	MAX.	MIN.	AVG.	MAX.	MIN.	AVG.
JAN	R	1.67	1.21	1.46	1.44	1.08	1.28	1.50	1.00	1.40
	T									
FEB	R	2.33	1.28	1.63	1.44	1.09	1.24	1.70	1.04	1.25
	T									
MAR	R	2.37	1.00	1.54	1.62	1.10	1.27	1.49	1.06	1.27
	T									
APR	R	1.72	1.10	1.45	1.69	1.16	1.29	1.58	1.00	1.30
	T									
MAY	R	2.78	1.07	1.80	2.49	1.20	1.64	2.40	1.26	1.65
	T									
JUN	R	2.83	1.17	1.82	1.94	0.95	1.60	2.27	1.17	1.64
	T									
JUL	R	2.34	1.30	1.75	2.61	1.43	1.80	2.27	1.54	1.83
	T									
AUG	R	2.54	1.59	2.19	3.76	1.50	2.10	2.30	1.21	1.86
	T									
SEP	R	2.47	1.69	2.03	2.41	1.75	2.02	2.10	1.22	1.80
	T									
OCT	R	1.93	1.36	1.57	2.81	0.40	1.72	1.89	1.18	1.40
	T									
NOV	R	1.95	1.06	1.54	2.84	1.22	1.54	1.97	1.07	1.30
	T									
DEC	R	2.06	1.27	1.64	1.90	1.23	1.45	1.94	0.98	1.37
	T									

R = RAW ; T = TREATED

TABLE 2.0: PARTICULATE REMOVAL SUMMARY

	PARAMETER		1987			1986			1985			1984		
			MAX.	MIN.	AVG.	MAX.	MIN.	AVG.	MAX.	MIN.	AVG.	MAX.	MIN.	AVG.
JAN	Turbidity (FTU)	R	48.00	4.00	22.29									
		T	1.00	0.11	0.44									
	Colour (TCU)	R												
		T												
	Prime Coagulant (mg/L)		7.68	4.33	6.54	5.80	3.40	4.46	8.20	1.10	6.55			
	Coagulant Aid (mg/L)													
	(1) (mg/L)													
	(2) (mg/L)													
	(3) (mg/L)													
	(4) (mg/L)													
	Metal Res. Al (mg/L)	R												
		T												
	pH	R	7.40	7.20	7.29	7.40	7.30	7.36	7.40	7.20	7.29			
		T												
	Temperature (Deg.C.)	R	2.00	1.00	1.50	4.50	2.00	3.20	4.00	1.00	2.20			
FEB	Turbidity (FTU)	R	4.00	1.80	2.79									
		T	0.90	0.12	0.32									
	Colour (TCU)	R												
		T												
	Prime Coagulant (mg/L)		4.86	2.74	3.73	5.67	2.90	4.43	8.26	5.99	7.06			
	Coagulant Aid (mg/L)													
	(1) (mg/L)													
	(2) (mg/L)													
	(3) (mg/L)													
	(4) (mg/L)													
	Metal Res. Al (mg/L)	R												
		T												
	pH	R	7.80	7.40	7.66	7.40	7.20	7.28	7.40	7.20	7.28			
		T												
	Temperature (Deg.C.)	R	4.00	1.00	2.00	3.50	3.00	3.30	2.00	2.00	2.00			

TABLE 2.0: PARTICULATE REMOVAL SUMMARY

	PARAMETER			1987			1986			1985			1984		
				MAX.	MIN.	AVG.	MAX.	MIN.	AVG.	MAX.	MIN.	AVG.	MAX.	MIN.	AVG.
MAR	Turbidity (FTU)		R	85.00	2.80	32.38									
			T	1.00	0.16	0.83									
	Colour (TCU)		R												
			T												
	Prime Coagulant	(mg/L)		14.09	3.57	6.94	9.49	4.54	6.63	10.15	7.07	8.86			
	Coagulant Aid	(mg/L)													
	(1)	(mg/L)													
	(2)	(mg/L)													
	(3)	(mg/L)													
	(4)	(mg/L)													
	Metal Res. Al	(mg/L)	R												
			T												
	pH		R	7.70	7.40	7.59	7.30	7.20	7.27	7.60	7.20	7.34			
			T												
	Temperature	(Deg.C.)	R	8.00	1.00	3.30	6.00	2.00	3.10	6.00	2.00	2.60			
APR	Turbidity (FTU)		R	95.00	14.00	39.33									
			T	1.00	0.20	0.48									
	Colour (TCU)		R												
			T												
	Prime Coagulant	(mg/L)		11.09	7.63	8.42	18.73	7.06	8.66	11.95	8.02	8.98			
	Coagulant Aid	(mg/L)													
	(1)	(mg/L)													
	(2)	(mg/L)													
	(3)	(mg/L)													
	(4)	(mg/L)													
	Metal Res. Al	(mg/L)	R												
			T												
	pH		R	7.80	7.60	7.61	7.40	7.20	7.32	7.40	7.20	7.26			
			T												
	Temperature	(Deg.C.)	R	12.00	4.00	8.20	11.00	7.50	8.60	14.00	4.00	8.30			

TABLE 2.0: PARTICULATE REMOVAL SUMMARY

	PARAMETER			1987			1986			1985			1984		
				MAX.	MIN.	AVG.	MAX.	MIN.	AVG.	MAX.	MIN.	AVG.	MAX.	MIN.	AVG.
MAY	Turbidity (FTU)		R	32.00	7.00	16.19									
			T	0.45	0.08	0.21									
	Colour (TCU)		R												
			T												
	Prime Coagulant	(mg/L)		8.29	3.44	5.79	9.23	3.63	6.63	9.32	3.89	6.21			
	Coagulant Aid	(mg/L)													
	(1)	(mg/L)													
	(2)	(mg/L)													
	(3)	(mg/L)													
	(4)	(mg/L)													
	Metal Res. Al	(mg/L)	R												
			T												
	pH		R	7.80	7.40	7.60	7.50	7.30	7.35	7.40	7.00	7.23			
			T												
	Temperature	(Deg.C.)	R	21.00	11.00	14.90	18.00	11.00	14.00	18.00	13.00	16.10			
JUN	Turbidity (FTU)		R	25.00	5.00	14.70	45.00	6.30	16.00						
			T	0.40	0.08	0.18	1.80	0.14	0.47						
	Colour (TCU)		R												
			T												
	Prime Coagulant	(mg/L)		5.61	3.43	4.36	12.24	5.27	7.02	7.22	3.98	5.44			
	Coagulant Aid	(mg/L)													
	(1)	(mg/L)													
	(2)	(mg/L)													
	(3)	(mg/L)													
	(4)	(mg/L)													
	Metal Res. Al	(mg/L)	R												
			T												
	pH		R	7.80	7.40	7.68	7.50	7.20	7.34	7.30	7.20	7.23			
			T												
	Temperature	(Deg.C.)	R	23.00	19.00	21.30	21.00	16.00	19.00	20.00	17.00	18.20			

TABLE 2.0: PARTICULATE REMOVAL SUMMARY

	PARAMETER		1987			1986			1985			1984		
			MAX.	MIN.	AVG.	MAX.	MIN.	AVG.	MAX.	MIN.	AVG.	MAX.	MIN.	AVG.
JUL	Turbidity (FTU)	R	65.00	8.00	19.32	18.40	3.20	6.91						
		T	0.42	0.07	0.19	0.72	0.09	0.23						
	Colour (TCU)	R												
		T												
	Prime Coagulant (mg/L)		16.98	3.72	4.90	10.43	4.25	5.82	5.68	3.36	4.80			
	Coagulant Aid (mg/L)													
	(1) (mg/L)													
	(2) (mg/L)													
	(3) (mg/L)													
	(4) (mg/L)													
	Metal Res. Al (mg/L)	R												
		T												
	pH	R	7.80	7.60	7.76	7.50	7.30	7.43	7.40	7.20	7.32			
		T												
	Temperature (Deg.C.)	R	26.00	21.00	23.90	25.00	21.00	23.10	24.00	20.00	22.70			
AUG	Turbidity (FTU)	R	19.00	6.00	10.94	25.00	3.20	10.48						
		T	0.95	0.06	0.35	0.68	0.06	0.28						
	Colour (TCU)	R												
		T												
	Prime Coagulant (mg/L)		7.56	2.75	4.56	5.14	3.48	4.39	5.46	2.63	4.18			
	Coagulant Aid (mg/L)													
	(1) (mg/L)													
	(2) (mg/L)													
	(3) (mg/L)													
	(4) (mg/L)													
	Metal Res. Al (mg/L)	R												
		T												
	pH	R	7.80	7.60	7.75	7.50	7.40	7.45	7.40	7.20	7.30			
		T												
	Temperature (Deg.C.)	R	26.00	20.00	23.90	24.50	20.00	23.00	23.00	21.00	22.10			

TABLE 2.0: PARTICULATE REMOVAL SUMMARY

	PARAMETER		1987			1986			1985			1984		
			MAX.	MIN.	AVG.	MAX.	MIN.	AVG.	MAX.	MIN.	AVG.	MAX.	MIN.	AVG.
SEP	Turbidity (FTU)	R	25.00	7.00	10.83	48.00	10.90	19.75						
		T	0.95	0.15	0.32	0.98	0.09	0.34						
	Colour (TCU)	R												
		T												
	Prime Coagulant (mg/L)		4.72	0.86	4.14	6.75	3.77	4.80	6.88	3.19	5.11			
	Coagulant Aid (mg/L)													
	(1) (mg/L)													
	(2) (mg/L)													
	(3) (mg/L)													
	(4) (mg/L)													
	Metal Res. Al (mg/L)	R												
		T												
	pH	R	7.80	7.60	7.77	7.60	7.40	7.49	7.50	7.20	7.36			
		T												
	Temperature (Deg.C.)	R	21.00	18.00	19.90	21.00	17.00	18.80	24.00	17.00	20.50			
OCT	Turbidity (FTU)	R	37.00	9.00	19.68	53.00	8.60	23.93						
		T	0.78	0.12	0.32	0.85	0.11	0.28						
	Colour (TCU)	R												
		T												
	Prime Coagulant (mg/L)		7.87	3.38	4.79	8.01	2.36	6.24	9.15	1.23	6.01			
	Coagulant Aid (mg/L)													
	(1) (mg/L)													
	(2) (mg/L)													
	(3) (mg/L)													
	(4) (mg/L)													
	Metal Res. Al (mg/L)	R												
		T												
	pH	R	7.80	7.50	7.71	7.60	7.20	7.52	7.50	7.30	7.35			
		T												
	Temperature (Deg.C.)	R	17.00	9.50	11.90	21.00	9.00	14.00	17.00	12.00	14.20			

TABLE 2.0: PARTICULATE REMOVAL SUMMARY

	PARAMETER		1987			1986			1985			1984		
			MAX.	MIN.	AVG.	MAX.	MIN.	AVG.	MAX.	MIN.	AVG.	MAX.	MIN.	AVG.
NOV	Turbidity (FTU)	R	97.00	8.00	23.63	63.00	11.00	25.96						
		T	0.99	0.09	0.44	0.85	0.10	0.30						
	Colour (TCU)	R												
		T												
	Prime Coagulant (mg/L)		5.86	3.10	4.53	7.55	5.97	6.83	10.03	4.74	7.87			
	Coagulant Aid (mg/L)													
	(1) (mg/L)													
	(2) (mg/L)													
	(3) (mg/L)													
	(4) (mg/L)													
	Metal Res. Al (mg/L)	R												
		T												
	pH	R	7.80	7.60	7.69	7.70	7.40	7.55	7.60	7.38	7.70			
		T												
	Temperature (Deg.C.)	R	9.50	4.50	7.30	12.00	4.00	7.00	12.00	5.00	8.80			
DEC	Turbidity (FTU)	R	110.00	23.00	45.81	73.00	20.00	37.84						
		T	4.70	0.40	1.48	0.95	0.22	0.53						
	Colour (TCU)	R												
		T												
	Prime Coagulant (mg/L)		9.14	4.35	7.27	9.45	5.69	6.99	11.38	4.04	7.16			
	Coagulant Aid (mg/L)													
	(1) (mg/L)													
	(2) (mg/L)													
	(3) (mg/L)													
	(4) (mg/L)													
	Metal Res. Al (mg/L)	R												
		T												
	pH	R	7.80	7.60	7.70	7.60	7.50	7.55	7.50	7.20	7.35			
		T												
	Temperature (Deg.C.)	R	6.00	2.00	3.50	4.00	1.50	2.50	5.00	2.00	2.60			

TABLE 2.1: PARTICULATE REMOVAL PROFILE (JANUARY 1985)

DATE	TURBIDITY (FTU)				COLOUR (TCU)		COAGULANT	COAG. AID	(1)	(2)	(3)	(4)	METAL RES. Al/Fe (mg/L)		pH		TEMP DEG. C.
	Raw	Set.	Filter	Treat.	Raw	Treat.	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Raw	Treat.	Raw	Treat.	
1							29.57								7.20		4.0
2							32.47								7.20		4.0
3							44.95								7.20		4.0
4							47.57								7.20		3.0
5							46.21								7.20		3.0
6							48.25								7.20		2.0
7							38.75								7.20		2.0
8							41.55								7.20		2.0
9							37.11								7.20		2.0
10							40.76								7.30		2.0
11							38.65								7.30		2.0
12							39.22								7.40		2.0
13							41.63								7.30		2.0
14							41.11								7.30		2.0
15							37.85								7.40		2.0
16							33.84								7.40		2.0
17							39.87								7.40		2.0
18							37.89								7.40		2.0
19							6.47								7.40		2.0
20							35.09								7.40		2.0
21							39.84								7.40		1.0
22							38.86								7.20		1.0
23							42.13								7.20		1.0
24							39.71								7.20		2.0
25							37.94								7.20		2.0
26							39.57								7.20		2.0
27							40.75								7.20		2.0
28							37.63								7.40		2.0
29							40.92								7.40		2.0
30							37.00								7.40		2.0
31							41.39								7.40		

TABLE 2.1: PARTICULATE REMOVAL PROFILE (FEBRUARY 1985)

DATE	TURBIDITY (FTU)				COLOUR (TCU)		COAGULANT	COAG. AID	(1)	(2)	(3)	(4)	METAL RES. Al/Fe (mg/L)		pH		TEMP DEG. C.
	Raw	Set.	Filter	Treat.	Raw	Treat.	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Raw	Treat.	Raw	Treat.	
1							38.54								7.20		2.0
2							35.25								7.20		2.0
3							36.81								7.20		2.0
4							38.03								7.20		2.0
5							39.15								7.20		2.0
6							41.37								7.20		2.0
7							37.36								7.20		2.0
8							42.07								7.20		2.0
9							40.65								7.20		2.0
10							48.58								7.20		2.0
11							45.06								7.20		2.0
12							42.20								7.20		2.0
13							39.54								7.20		2.0
14							43.80								7.20		2.0
15							40.85								7.40		2.0
16							45.12								7.40		2.0
17							45.99								7.40		2.0
18							42.45								7.40		2.0
19							45.75								7.40		2.0
20							43.13								7.40		2.0
21							44.38								7.40		2.0
22							42.40								7.40		2.0
23							41.98								7.40		2.0
24							38.21								7.30		2.0
25							41.59								7.30		2.0
26							41.65								7.30		2.0
27							40.34								7.30		2.0
28							40.25								7.30		2.0
29																	
30																	
31																	

TABLE 2.1: PARTICULATE REMOVAL PROFILE (MARCH 1985)

DATE	TURBIDITY (FTU)				COLOUR (TCU)		COAGULANT	COAG. AID	(1)	(2)	(3)	(4)	METAL RES. Al/Fe (mg/L)		pH		TEMP DEG. C.
	Raw	Set.	Filter	Treat.	Raw	Treat.	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Raw	Treat.	Raw	Treat.	
1							44.75								7.30		3.0
2							42.12								7.30		3.0
3							41.56								7.30		3.0
4							45.73								7.30		3.0
5							57.06								7.30		2.0
6							53.34								7.30		2.0
7							57.32								7.30		2.0
8							58.82								7.40		2.0
9							59.70								7.30		2.0
10							59.44								7.20		2.0
11							46.09								7.40		2.5
12							47.47								7.30		2.0
13							48.17								7.40		2.0
14							45.03								7.30		2.0
15							51.88								7.40		2.0
16							50.92								7.60		2.0
17							51.79								7.60		2.0
18							51.37								7.60		2.0
19							54.48								7.60		2.0
20							53.12								7.60		2.0
21							57.59								7.20		2.0
22							55.95								7.20		2.0
23							48.28								7.30		2.0
24							56.58								7.30		2.0
25							53.59								7.30		3.0
26							55.65								7.30		3.0
27							52.26								7.20		3.0
28							55.99								7.20		4.0
29							54.28								7.20		4.0
30							53.70								7.20		5.0
31							50.77								7.20		6.0

TABLE 2.1: PARTICULATE REMOVAL PROFILE (APRIL 1985)

DATE	TURBIDITY (FTU)				COLOUR (TCU)		COAGULANT	COAG. AID	(1)	(2)	(3)	(4)	METAL RES. Al/Fe (mg/L)		pH		TEMP DEG. C.
	Raw	Set.	Filter	Treat.	Raw	Treat.	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Raw	Treat.	Raw	Treat.	
1							53.13								7.20		6.0
2							49.76								7.40		5.0
3							53.25								7.40		4.0
4							51.74								7.30		5.0
5							50.99								7.20		5.0
6							53.65								7.20		5.0
7							70.30								7.30		5.0
8							50.69								7.30		5.0
9							52.10								7.30		5.0
10							49.12								7.20		5.0
11							52.59								7.20		5.0
12							50.81								7.20		6.0
13							55.05								7.30		6.0
14							54.78								7.20		8.0
15							51.68								7.20		8.0
16							47.18								7.40		8.5
17							48.62								7.40		8.0
18							52.10								7.40		8.0
19							51.53								7.30		9.0
20							48.43								7.20		10.0
21							47.83								7.20		11.0
22							51.29								7.20		12.0
23							56.32								7.20		12.0
24							56.74								7.30		12.0
25							52.54								7.20		12.0
26							55.93								7.20		12.0
27							52.90								7.20		12.0
28							51.35								7.20		12.0
29							54.55								7.20		13.0
30							57.93								7.20		14.0
31																	

TABLE 2.1: PARTICULATE REMOVAL PROFILE (MAY 1985)

DATE	TURBIDITY (FTU)				COLOUR (TCU)		COAGULANT	COAG. AID	(1)	(2)	(3)	(4)	METAL RES. Al/Fe (mg/L)		pH		TEMP DEG. C.
	Raw	Set.	Filter	Treat.	Raw	Treat.	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Raw	Treat.	Raw	Treat.	
1							53.94								7.20		14.0
2							54.85								7.40		14.0
3							38.16								7.30		14.0
4							37.69								7.20		13.0
5							46.22								7.00		13.0
6							36.02								7.10		13.0
7							34.97								7.20		14.0
8							34.56								7.20		14.0
9							32.68								7.20		14.0
10							35.16								7.20		14.0
11							36.61								7.20		15.0
12							34.21								7.20		16.0
13							37.37								7.30		16.0
14							35.78								7.30		16.0
15							35.99								7.20		17.0
16							54.25								7.20		17.0
17							35.87								7.30		17.0
18							30.86								7.20		17.0
19							32.91								7.20		17.0
20							32.70								7.30		17.0
21							33.69								7.30		17.0
22							35.79								7.20		18.0
23							32.27								7.30		18.0
24							32.15								7.30		17.0
25							33.75								7.30		18.0
26							34.99								7.20		18.0
27							34.49								7.20		18.0
28							34.52								7.20		18.0
29							33.70								7.20		18.0
30							34.25								7.30		18.0
31							22.88								7.20		18.0

WATER PLANT OPTIMIZATION STUDY
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TABLE 2.1: PARTICULATE REMOVAL PROFILE (JUNE 1985)

DATE	TURBIDITY (FTU)				COLOUR (TCU)		COAGULANT	COAG. AID	(1)	(2)	(3)	(4)	METAL RES. Al/Fe (mg/L)		pH		TEMP DEG. C.
	Raw	Set.	Filter	Treat.	Raw	Treat.	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Raw	Treat.	Raw	Treat.	
1							42.46								7.30		19.0
2							33.83								7.20		18.0
3							32.44								7.20		18.0
4							32.08								7.30		18.0
5							30.83								7.20		18.0
6							32.15								7.20		18.0
7							32.75								7.30		18.0
8							31.21								7.20		18.5
9							31.35								7.20		18.0
10							34.59								7.20		18.5
11							38.99								7.20		19.0
12							30.11								7.20		18.0
13							25.99								7.20		17.0
14							30.48								7.20		18.0
15							29.05								7.20		18.0
16							23.41								7.20		18.0
17							29.70								7.20		18.0
18							29.88								7.20		18.0
19							28.35								7.30		18.0
20							29.37								7.30		17.0
21							30.62								7.30		17.0
22							30.96								7.20		18.0
23							32.32								7.20		18.0
24							30.74								7.20		18.0
25							31.01								7.30		18.0
26							30.50								7.20		18.0
27							31.52								7.20		19.0
28							37.51								7.20		20.0
29							37.96								7.30		20.0
30							37.74								7.20		20.0
31																	

TABLE 2.1: PARTICULATE REMOVAL PROFILE (JULY 1985)

DATE	TURBIDITY (FTU)				COLOUR (TCU)		COAGULANT	COAG. AID	(1)	(2)	(3)	(4)	METAL RES. Al/Fe (mg/L)		pH		TEMP DEG. C.
	Raw	Set.	Filter	Treat.	Raw	Treat.	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Raw	Treat.	Raw	Treat.	
1							19.75								7.40		
2							31.00								7.30		
3							29.53								7.30		
4							30.23								7.40		
5							28.62								7.40		
6							26.79								7.20		
7							31.50								7.30		
8							29.83								7.20		
9							28.44								7.20		
10							33.38								7.30		
11							28.10								7.40		
12							27.60								7.30		
13							27.15								7.20		
14							25.64								7.40		
15							29.69								7.30		
16							28.84								7.30		
17							27.28								7.30		
18							27.09								7.40		
19							29.89								7.40		
20							29.72								7.40		
21							27.20								7.40		
22							25.15								7.40		
23							24.82								7.30		
24							26.79								7.30		
25							27.82								7.30		
26							28.35								7.30		
27							27.89								7.20		
28							32.75								7.20		
29							30.74								7.40		
30							27.12								7.40		
31							26.31								7.40		

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STONEY POINT WATER TREATMENT PLANT

TABLE 2.1: PARTICULATE REMOVAL PROFILE (AUGUST 1985)

DATE	TURBIDITY (FTU)				COLOUR (TCU)		COAGULANT	COAG. AID	(1)	(2)	(3)	(4)	METAL RES. Al/Fe (mg/L)		pH		TEMP DEG. C.
	Raw	Set.	Filter	Treat.	Raw	Treat.	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Raw	Treat.	Raw	Treat.	
1							32.10								7.20		22.5
2							25.26								7.20		22.5
3							24.82								7.20		22.0
4							27.14								7.20		22.0
5							25.87								7.20		22.0
6							29.74								7.20		22.0
7							23.76								7.30		22.0
8							26.39								7.20		22.0
9							25.83								7.20		22.5
10							28.06								7.40		22.5
11							24.42								7.40		22.5
12							28.26								7.30		22.5
13							20.19								7.40		22.5
14							25.73								7.30		22.5
15							25.30								7.30		23.0
16							25.51								7.40		23.0
17							15.46								7.40		22.0
18							21.26								7.40		22.5
19							21.96								7.30		22.5
20							23.89								7.30		22.0
21							16.14								7.30		22.0
22							18.71								7.30		22.0
23							26.63								7.40		21.5
24							22.60								7.30		22.0
25							26.84								7.30		22.0
26							29.28								7.30		21.0
27							26.82								7.30		21.5
28							19.36								7.30		21.5
29							20.44								7.30		21.5
30							23.89								7.30		22.0
31							30.49								7.40		22.0

TABLE 2.1: PARTICULATE REMOVAL PROFILE (SEPTEMBER 1985)

DATE	TURBIDITY (FTU)				COLOUR (TCU)		COAGULANT	COAG. AID	(1)	(2)	(3)	(4)	METAL RES. Al/Fe (mg/L)		pH		TEMP DEG. C.
	Raw	Set.	Filter	Treat.	Raw	Treat.	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Raw	Treat.	Raw	Treat.	
1							22.85								7.50		22.0
2							32.41								7.30		21.5
3							24.88								7.40		21.5
4							30.68								7.30		22.0
5							34.88								7.30		22.0
6							29.80								7.30		23.0
7							35.28								7.30		23.0
8							40.50								7.30		24.0
9							25.08								7.40		24.0
10							19.95								7.40		24.0
11							20.17								7.30		23.0
12							18.75								7.30		22.0
13							30.86								7.30		21.0
14							30.59								7.50		19.0
15							28.45								7.40		19.0
16							28.42								7.30		18.0
17							33.62								7.30		19.0
18							29.55								7.40		19.0
19							33.55								7.40		19.0
20							33.62								7.50		20.0
21							29.22								7.40		20.0
22							34.76								7.40		20.0
23							30.51								7.40		20.0
24							31.65								7.20		20.0
25							30.73								7.20		19.0
26							29.80								7.20		18.5
27							31.57								7.40		18.0
28							32.91								7.40		18.0
29							33.69								7.50		17.5
30							33.21								7.40		17.0
31																	

TABLE 2.1: PARTICULATE REMOVAL PROFILE (OCTOBER 1985)

DATE	TURBIDITY (FTU)				COLOUR (TCU)		COAGULANT	COAG. AID	(1)	(2)	(3)	(4)	METAL RES. Al/Fe (mg/L)		pH		TEMP DEG. C.
	Raw	Set.	Filter	Treat.	Raw	Treat.	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Raw	Treat.	Raw	Treat.	
1							28.72								7.40		17.0
2							33.23								7.40		17.0
3							29.93								7.40		16.0
4							30.18								7.40		16.0
5							27.26								7.40		15.5
6							33.32								7.30		15.0
7							33.41								7.30		14.0
8							34.09								7.30		13.5
9							33.57								7.30		13.5
10							34.04								7.30		13.5
11							36.50								7.30		14.0
12							35.06								7.40		14.0
13							39.68								7.40		14.0
14							33.98								7.40		14.5
15							34.52								7.40		14.5
16							33.73								7.30		14.5
17							35.25								7.30		14.0
18							37.51								7.30		14.0
19							36.34								7.30		14.0
20							7.21								7.30		14.0
21							35.39								7.30		14.0
22							53.83								7.30		13.5
23							40.96								7.30		13.5
24							41.76								7.30		14.0
25							40.13								7.30		14.0
26							46.94								7.40		14.0
27							32.24								7.40		14.0
28							39.29								7.40		14.0
29							37.06								7.50		13.0
30							39.64								7.40		12.0
31							40.78								7.40		12.0

TABLE 2.1: PARTICULATE REMOVAL PROFILE (NOVEMBER 1985)

DATE	TURBIDITY (FTU)				COLOUR (TCU)		COAGULANT	COAG. AID	(1)	(2)	(3)	(4)	METAL RES. Al/Fe (mg/L)		pH		TEMP DEG. C.
	Raw	Set.	Filter	Treat.	Raw	Treat.	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Raw	Treat.	Raw	Treat.	
1							35.76								7.40		12.0
2							42.57								7.40		12.0
3							42.97								7.30		12.0
4							28.20								7.30		12.0
5							46.81								7.30		12.0
6							39.94								7.30		12.0
7							43.75								7.30		11.5
8							42.23								7.30		11.0
9							42.42								7.40		10.0
10							42.19								7.40		10.0
11							42.61								7.40		9.5
12							38.93								7.40		9.0
13							48.20								7.50		9.0
14							44.38								7.60		8.5
15							44.45								7.40		8.5
16							38.61								7.40		9.0
17							59.02								7.40		8.0
18							49.30								7.40		8.0
19							48.89								7.40		8.0
20							49.89								7.40		8.0
21							51.70								7.40		8.0
22							51.10								7.40		8.0
23							50.45								7.30		7.0
24							48.10								7.30		7.0
25							51.23								7.40		6.0
26							57.92								7.40		6.0
27							48.58								7.40		6.0
28							55.28								7.40		5.0
29							52.00								7.40		5.0
30							50.96								7.40		5.0
31																	

WATER PLANT OPTIMIZATION STUDY
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TABLE 2.1: PARTICULATE REMOVAL PROFILE (DECEMBER 1985)

DATE	TURBIDITY (FTU)				COLOUR (TCU)		COAGULANT	COAG. AID	(1)	(2)	(3)	(4)	METAL RES. Al/Fe (mg/L)		pH		TEMP DEG. C.
	Raw	Set.	Filter	Treat.	Raw	Treat.	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Raw	Treat.	Raw	Treat.	
1							54.35								7.30		
2							47.07								7.30		
3							53.12								7.30		
4							52.84								7.30		
5							49.47								7.30		
6							48.01								7.40		
7							53.61								7.40		
8							47.44								7.40		
9							50.53								7.40		
10							49.15								7.30		
11							51.19								7.40		
12							46.50								7.30		
13							47.25								7.30		
14							48.33								7.30		
15							48.01								7.30		
16							46.82								7.30		
17							50.38								7.30		
18							45.17								7.30		
19							66.94								7.20		
20							35.30								7.20		
21							28.64								7.40		
22							30.81								7.50		
23							26.75								7.40		
24							32.36								7.40		
25							23.75								7.30		
26							27.03								7.40		
27							28.08								7.40		
28							30.60								7.40		
29							27.14								7.40		
30							29.52								7.40		
31							28.97								7.40		

TABLE 2.1: PARTICULATE REMOVAL PROFILE (JANUARY 1986)

DATE	TURBIDITY (FTU)				COLOUR (TCU)		COAGULANT	COAG. AID	(1)	(2)	(3)	(4)	METAL RES. Al/Fe (mg/L)		pH		TEMP DEG. C.
	Raw	Set.	Filter	Treat.	Raw	Treat.	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Raw	Treat.	Raw	Treat.	
1							31.21								7.40		
2							25.45								7.40		
3							25.89								7.40		
4							29.03								7.40		
5							28.40								7.40		
6							26.99								7.40		
7							25.15								7.40		
8							29.13								7.40		
9							34.10								7.40		
10							26.69								7.40		
11							26.84								7.40		
12							27.53								7.40		
13							29.61								7.40		
14							27.61								7.30		
15							28.95								7.30		
16							31.90								7.30		
17							24.86								7.30		
18							20.32								7.40		
19							25.37								7.40		
20							22.59								7.30		
21							24.18								7.30		
22							23.92								7.30		
23							23.10								7.30		
24							24.01								7.30		
25							20.01								7.30		
26							25.16								7.30		
27							22.77								7.30		
28							25.20								7.30		
29							24.77								7.40		
30							25.72								7.40		
31															7.40		

TABLE 2.1: PARTICULATE REMOVAL PROFILE (FEBRUARY 1986)

DATE	TURBIDITY (FTU)				COLOUR (TCU)		COAGULANT	COAG. AID	(1)	(2)	(3)	(4)	METAL RES. Al/Fe (mg/L)		pH		TEMP DEG. C.
	Raw	Set.	Filter	Treat.	Raw	Treat.	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Raw	Treat.	Raw	Treat.	
1							26.40								7.30		3.0
2							25.47								7.20		3.0
3							20.99								7.30		3.0
4							23.99								7.30		3.0
5							24.17								7.40		3.0
6							24.07								7.20		3.0
7							17.08								7.20		3.0
8							20.32								7.20		3.0
9							20.88								7.20		3.0
10							20.54								7.20		3.0
11							21.20								7.20		3.0
12							20.08								7.20		3.0
13							23.47								7.40		3.0
14							29.10								7.30		3.5
15							27.77								7.30		3.5
16							26.00								7.30		3.5
17							27.80								7.30		3.5
18							26.73								7.30		3.5
19							27.07								7.30		3.5
20							29.56								7.30		3.5
21							30.34								7.30		3.5
22							30.44								7.30		3.5
23							29.34								7.30		3.5
24							30.85								7.30		3.5
25							31.53								7.30		3.5
26							28.86								7.30		3.5
27							32.50								7.30		3.5
28							33.38								7.30		3.0
29																	
30																	
31																	

TABLE 2.1: PARTICULATE REMOVAL PROFILE (MARCH 1986)

DATE	TURBIDITY (FTU)				COLOUR (TCU)		COAGULANT	COAG. AID	(1)	(2)	(3)	(4)	METAL RES. Al/Fe (mg/L)		pH		TEMP DEG. C.
	Raw	Set.	Filter	Treat.	Raw	Treat.	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Raw	Treat.	Raw	Treat.	
1							29.27								7.30		3.0
2							36.55								7.30		3.0
3							28.75								7.30		3.0
4							37.59								7.30		3.0
5							32.02								7.30		3.0
6							30.11								7.30		3.0
7							33.19								7.30		3.0
8							34.32								7.30		2.5
9							32.92								7.30		2.5
10							28.32								7.30		2.5
11							27.67								7.30		2.5
12							27.11								7.30		3.0
13							26.73								7.30		3.0
14							36.59								7.30		3.0
15							32.91								7.30		3.0
16							31.94								7.30		3.0
17							31.64								7.30		3.0
18							32.42								7.30		3.0
19							29.96								7.30		4.0
20							46.49								7.30		2.0
21							47.72								7.30		2.0
22							48.80								7.20		2.0
23							47.11								7.20		3.0
24							46.51								7.20		2.5
25							50.66								7.20		2.5
26							55.83								7.20		3.0
27							53.50								7.20		3.0
28							52.31								7.20		4.5
29							54.87								7.20		5.0
30							53.67								7.20		6.0
31							51.78								7.20		6.0

TABLE 2.1: PARTICULATE REMOVAL PROFILE (APRIL 1986)

DATE	TURBIDITY (FTU)				COLOUR (TCU)		COAGULANT	COAG. AID	(1)	(2)	(3)	(4)	METAL RES. Al/Fe (mg/L)		pH		TEMP DEG. C.
	Raw	Set.	Filter	Treat.	Raw	Treat.	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Raw	Treat.	Raw	Treat.	
1							52.71								7.20		7.5
2							50.44								7.20		7.5
3							48.68								7.20		8.0
4							50.38								7.20		9.0
5							50.86								7.40		8.5
6							51.59								7.40		9.0
7							49.41								7.40		9.0
8							47.51								7.30		10.0
9							53.01								7.30		10.0
10							52.82								7.40		8.0
11							54.21								7.40		8.0
12							52.38								7.40		7.5
13							46.60								7.40		8.0
14							51.36								7.30		8.0
15							51.81								7.20		8.0
16							50.67								7.20		8.5
17							49.49								7.20		8.0
18							50.20								7.40		8.0
19							45.06								7.40		8.5
20							44.85								7.30		8.5
21							110.18								7.30		8.0
22							50.08								7.30		8.0
23							44.64								7.40		8.0
24							46.93								7.30		8.0
25							47.02								7.30		9.0
26							43.87								7.30		9.0
27							47.85								7.30		9.0
28							41.55								7.40		10.0
29							46.89								7.40		10.0
30							44.72								7.30		11.0
31																	

TABLE 2.1: PARTICULATE REMOVAL PROFILE (MAY 1986)

DATE	TURBIDITY (FTU)				COLOUR (TCU)		COAGULANT	COAG. AID	(1)	(2)	(3)	(4)	METAL RES. Al/Fe (mg/L)		pH		TEMP DEG. C.
	Raw	Set.	Filter	Treat.	Raw	Treat.	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Raw	Treat.	Raw	Treat.	
1							54.27								7.30		12.0
2							37.40								7.30		11.0
3							40.65								7.40		11.0
4							41.38								7.50		11.0
5							40.93								7.40		11.0
6							43.63								7.40		12.0
7							40.43								7.30		12.0
8							41.83								7.30		13.0
9							42.10								7.30		13.0
10							39.92								7.30		13.0
11							46.55								7.30		13.0
12							43.19								7.40		14.0
13							42.68								7.40		15.0
14							43.35								7.40		15.0
15							41.82								7.40		15.0
16							43.17								7.30		15.0
17							38.81								7.30		15.0
18							45.05								7.30		15.0
19							40.83								7.30		15.0
20							33.63								7.30		15.0
21							23.93								7.30		15.0
22							21.34								7.30		14.0
23							31.01								7.30		14.0
24							32.31								7.30		14.0
25							36.60								7.30		15.0
26							36.22								7.40		15.5
27							32.26								7.40		16.0
28							37.79								7.40		15.0
29							36.55								7.40		15.0
30							38.60								7.40		15.0
31							40.71								7.40		18.0

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TABLE 2.1: PARTICULATE REMOVAL PROFILE (JUNE 1986)

DATE	TURBIDITY (FTU)				COLOUR (TCU)		COAGULANT	COAG. AID	(1)	(2)	(3)	(4)	METAL RES. Al/Fe (mg/L)		pH		TEMP DEG. C.
	Raw	Set.	Filter	Treat.	Raw	Treat.	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Raw	Treat.	Raw	Treat.	
1	22.00			0.42			37.11								7.40		18.0
2	44.00			1.80			37.72								7.40		18.0
3	28.00			0.43			35.04								7.40		18.0
4	45.00			0.62			32.36								7.40		18.0
5	27.00			0.25			34.36								7.40		18.0
6	32.00			0.26			45.66								7.20		18.5
7	6.60			0.26			33.67								7.20		18.0
8	10.00			0.28			30.99								7.20		16.0
9	9.50			1.01			40.24								7.30		18.0
10	10.20			0.14			40.35								7.40		18.0
11	10.40			0.18			39.35								7.40		18.0
12	8.50			0.19			39.09								7.40		18.0
13	10.80			0.55			39.29								7.40		18.0
14	12.40			1.30			42.26								7.30		19.0
15	10.00			1.20			71.98								7.20		19.0
16	6.30			0.58			40.60								7.20		19.0
17	22.00			0.34			39.65								7.30		19.0
18	10.30			0.40			38.82								7.30		19.0
19	12.40			0.14			40.62								7.30		19.0
20	6.80			0.42			40.44								7.30		19.0
21	14.80			0.55			40.02								7.20		19.0
22	18.80			0.42			39.95								7.20		19.0
23	13.60			0.45			40.44								7.30		20.0
24	8.80			0.31			44.10								7.40		21.0
25	19.00			0.23			41.20								7.40		21.0
26	10.50			0.56			48.83								7.50		21.0
27	12.20			0.24			46.97								7.50		21.0
28	10.10			0.21			46.55								7.40		21.0
29	9.20			0.20			53.62								7.40		21.0
30	18.80			0.18			36.89								7.40		21.0
31																	

TABLE 2.1: PARTICULATE REMOVAL PROFILE (JULY 1986)

DATE	TURBIDITY (FTU)				COLOUR (TCU)		COAGULANT	COAG. AID	(1)	(2)	(3)	(4)	METAL RES. Al/Fe (mg/L)		pH		TEMP DEG. C.
	Raw	Set.	Filter	Treat.	Raw	Treat.	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Raw	Treat.	Raw	Treat.	
1	18.40			0.15			43.58								7.40		21.0
2	11.50			0.15			36.08								7.40		21.0
3	13.00			0.30			36.93								7.40		21.0
4	9.70			0.22			36.09								7.50		21.0
5	10.80			0.19			36.89								7.40		21.0
6	8.50			0.20			37.42								7.40		21.0
7	8.50			0.72			37.03								7.40		22.0
8	6.20			0.28			38.78								7.40		23.0
9	5.10			0.31			38.80								7.40		23.0
10	4.80			0.28			39.11								7.40		22.0
11	4.60			0.14			42.39								7.40		22.0
12	4.20			0.15			40.87								7.40		22.0
13	3.30			0.13			61.33								7.40		22.0
14	4.50			0.15			31.98								7.40		22.0
15	4.60			0.27			32.17								7.40		22.0
16	4.40			0.43			31.86								7.30		22.0
17	3.30			0.14			31.52								7.40		22.5
18	4.00			0.30			30.32								7.40		23.5
19	3.50			0.24			32.30								7.50		24.0
20	3.20			0.14			32.07								7.50		24.0
21	4.60			0.09			33.27								7.50		25.0
22	5.80			0.34			31.89								7.50		25.0
23	4.50			0.13			31.45								7.50		25.0
24	4.60			0.30			29.09								7.50		25.0
25	3.90			0.20			32.37								7.40		25.0
26	4.20			0.21			26.81								7.50		25.0
27	9.20			0.19			25.98								7.50		25.0
28	14.20			0.20			25.02								7.40		25.0
29	10.20			0.18			25.64								7.50		25.0
30	12.40			0.19			26.80								7.50		24.5
31	4.40			0.23			25.19								7.40		24.5

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TABLE 2.1: PARTICULATE REMOVAL PROFILE (AUGUST 1986)

DATE	TURBIDITY (FTU)				COLOUR (TCU)		COAGULANT	COAG. AID	(1)	(2)	(3)	(4)	METAL RES. Al/Fe (mg/L)		pH		TEMP DEG. C.
	Raw	Set.	Filter	Treat.	Raw	Treat.	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Raw	Treat.	Raw	Treat.	
1	3.40			0.24			25.62								7.50		24.5
2	4.40			0.22			25.49								7.40		24.5
3	5.80			0.14			30.00								7.50		24.5
4	4.30			0.18			27.84								7.50		24.0
5	3.40			0.06			27.35								7.50		24.0
6	4.10			0.19			27.61								7.50		24.0
7	3.80			0.31			28.57								7.50		24.0
8	3.20			0.25			24.58								7.50		24.0
9	5.30			0.50			25.79								7.50		24.0
10	4.30			0.42			26.60								7.40		24.0
11	6.00			0.26			27.77								7.40		24.0
12	6.40			0.68			25.36								7.50		24.0
13	6.90			0.31			26.82								7.40		22.0
14	7.20			0.24			25.94								7.40		23.0
15	7.00			0.21			27.07								7.50		23.0
16	8.40			0.19			30.25								7.50		23.0
17	6.50			0.23			21.63								7.50		23.0
18	7.30			0.17			26.25								7.40		23.0
19	8.90			0.60			25.02								7.40		23.0
20	19.60			0.59			24.13								7.40		23.0
21	25.00			0.24			22.98								7.40		23.0
22	6.80			0.28			23.55								7.50		23.0
23	8.40			0.32			28.55								7.40		22.5
24	24.40			0.68			25.02								7.40		22.5
25	24.00			0.22			24.42								7.40		22.5
26	13.10			0.10			24.72								7.40		21.5
27	19.80			0.17			20.47								7.40		21.0
28	23.00			0.23			24.40								7.50		20.0
29	21.00			0.20			26.50								7.50		20.0
30	15.00			0.19			24.70								7.40		20.0
31	18.20			0.12			25.05										

TABLE 2.1: PARTICULATE REMOVAL PROFILE (SEPTEMBER 1986)

DATE	TURBIDITY (FTU)				COLOUR (TCU)		COAGULANT	COAG. AID	(1)	(2)	(3)	(4)	METAL RES. Al/Fe (mg/L)		pH		TEMP DEG. C.
	Raw	Set.	Filter	Treat.	Raw	Treat.	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Raw	Treat.	Raw	Treat.	
1	17.40			0.10			23.86								7.40		20.0
2	14.80			0.18			24.84								7.40		20.0
3	14.50			0.17			24.28								7.50		20.0
4	19.10			0.18			24.42								7.50		20.0
5	16.60			0.85			24.45								7.50		20.0
6	18.20			0.12			25.08								7.50		21.0
7	20.00			0.42			22.16								7.50		20.0
8	18.80			0.18			23.77								7.50		18.5
9	18.60			0.21			24.05								7.60		18.0
10	16.50			0.50			24.63								7.60		18.0
11	16.30			0.10			23.95								7.60		19.0
12	24.00			0.30			24.45								7.50		19.0
13	26.00			0.34			23.40								7.50		19.0
14	17.90			0.09			23.81								7.50		18.5
15	15.60			0.12			24.25								7.50		18.0
16	26.00			0.21			24.11								7.50		18.0
17	25.00			0.11			23.55								7.50		17.5
18	48.00			0.25			23.52								7.50		17.0
19	35.00			0.98			34.22								7.50		17.0
20	20.00			0.45			30.38								7.50		17.0
21	21.00			0.85			34.53								7.50		17.0
22	21.00			0.59			34.12								7.40		17.0
23	18.70			0.32			34.00								7.40		18.0
24	17.40			0.61			35.08								7.40		18.5
25	17.80			0.25			34.99								7.50		19.0
26	15.40			0.15			34.51								7.50		19.0
27	16.40			0.38			39.72								7.40		19.0
28	12.90			0.62			36.22								7.50		20.0
29	12.70			0.20			31.79								7.50		20.0
30	10.90			0.32			34.84								7.60		21.0
31																	

TABLE 2.1: PARTICULATE REMOVAL PROFILE (OCTOBER 1986)

DATE	TURBIDITY (FTU)				COLOUR (TCU)		COAGULANT	COAG. AID	(1)	(2)	(3)	(4)	METAL RES. Al/Fe (mg/L)		pH		TEMP DEG. C.
	Raw	Set.	Filter	Treat.	Raw	Treat.	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Raw	Treat.	Raw	Treat.	
1	11.10			0.11			30.77								7.50		21.0
2	14.50			0.25			38.18								7.50		21.0
3	12.30			0.16			29.33								7.20		20.0
4	8.60			0.20			31.17								7.40		20.0
5	10.70			0.15			31.15								7.40		20.0
6	49.00			0.18			34.40								7.40		17.0
7	38.00			0.28			29.81								7.50		17.0
8	18.40			0.24			35.19								7.60		15.0
9	22.70			0.27			31.05								7.60		15.0
10	21.60			0.30			37.39								7.50		15.0
11	32.70			0.62			47.10								7.50		14.0
12	34.60			0.34			25.85								7.50		14.0
13	35.20			0.27			13.91								7.60		11.0
14	27.00			0.69			33.28								7.60		9.0
15	53.00			0.85			39.15								7.60		10.0
16	29.00			0.50			41.21								7.60		11.5
17	42.00			0.12			46.28								7.60		12.0
18	38.00			0.11			43.78								7.60		13.0
19	27.00			0.29			44.41								7.60		12.0
20	30.00			0.22			41.78								7.60		11.5
21	33.00			0.21			39.58								7.60		11.5
22	12.00			0.15			38.33								7.50		12.0
23	17.00			0.17			39.63								7.50		12.5
24	11.00			0.23			37.26								7.50		12.5
25	13.00			0.24			44.39								7.50		12.5
26	12.00			0.21			30.94								7.50		12.5
27	15.00			0.39			40.08								7.50		12.5
28	19.30			0.27			40.75								7.50		12.0
29	19.00			0.17			39.18								7.50		12.0
30	20.00			0.36			41.59								7.50		12.0
31	15.00			0.18			41.84								7.50		12.0

TABLE 2.1: PARTICULATE REMOVAL PROFILE (NOVEMBER 1986)

DATE	TURBIDITY (FTU)				COLOUR (TCU)		COAGULANT	COAG. AID	(1)	(2)	(3)	(4)	METAL RES. Al/Fe (mg/L)		pH		TEMP DEG. C.
	Raw	Set.	Filter	Treat.	Raw	Treat.	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Raw	Treat.	Raw	Treat.	
1	15.00			0.29			41.14								7.40		11.5
2	21.00			0.21			41.00								7.60		12.0
3	24.00			0.10			40.59								7.70		11.5
4	29.00			0.10			40.84								7.60		11.0
5	35.00			0.14			37.85								7.50		10.0
6	26.00			0.24			44.40								7.50		10.0
7	22.00			0.53			39.01								7.50		10.0
8	25.00			0.22			42.58								7.50		10.0
9	57.00			0.85			39.63								7.60		10.0
10	63.00			0.62			35.13								7.50		10.0
11	19.60			0.74			42.72								7.40		9.5
12	28.00			0.47			38.24								7.50		9.0
13	43.00			0.23			36.72								7.50		8.5
14	42.00			0.62			39.52								7.60		7.0
15	24.00			0.26			40.15								7.60		5.0
16	18.00			0.24			41.00								7.60		4.0
17	20.00			0.24			39.82								7.60		5.0
18	11.00			0.35			40.20								7.60		5.0
19	25.00			0.39			41.41								7.60		5.0
20	34.00			0.16			43.12								7.60		4.5
21	26.00			0.23			39.77								7.60		4.0
22	21.00			0.15			40.05								7.60		4.0
23	15.00			0.13			42.52								7.60		4.5
24	18.00			0.10			38.28								7.60		4.0
25	19.00			0.13			43.86								7.60		4.0
26	15.20			0.24			37.36								7.50		4.0
27	26.00			0.14			40.73								7.50		4.0
28	17.00			0.22			38.15								7.50		4.0
29	18.00			0.28			38.60								7.50		4.0
30	22.00			0.48			41.39								7.50		4.0
31																	

TABLE 2.1: PARTICULATE REMOVAL PROFILE (DECEMBER 1986)

DATE	TURBIDITY (FTU)				COLOUR (TCU)		COAGULANT	COAG. AID	(1)	(2)	(3)	(4)	METAL RES. Al/Fe (mg/L)		pH		TEMP DEG. C.
	Raw	Set.	Filter	Treat.	Raw	Treat.	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Raw	Treat.	Raw	Treat.	
1	20.00			0.22			34.98								7.50		4.0
2	73.00			0.92			48.78								7.60		4.0
3	43.00			0.72			36.91								7.60		4.0
4	42.00			0.65			47.12								7.60		4.0
5	29.00			0.49			40.33								7.60		3.0
6	27.00			0.95			44.66								7.60		3.0
7	28.00			0.45			40.47								7.60		2.5
8	37.00			0.26			40.65								7.60		2.5
9	28.00			0.30			41.09								7.60		2.5
10	38.00			0.48			40.37								7.50		2.5
11	34.00			0.58			43.27								7.50		2.0
12	30.00			0.54			39.29								7.50		2.0
13	39.00			0.22			41.08								7.50		2.0
14	41.00			0.48			37.67								7.50		2.0
15	37.00			0.48			38.84								7.50		2.0
16	28.00			0.35			41.26								7.50		1.5
17	35.00			0.37			38.94								7.60		1.5
18	32.00			0.51			41.28								7.60		1.5
19	45.00			0.60			36.91								7.60		1.5
20	68.00			0.65			45.28								7.50		1.5
21	53.00			0.72			39.49								7.50		2.0
22	29.00			0.91			39.54								7.50		2.0
23	40.00			0.49			35.37								7.50		2.0
24	32.00			0.78			33.46								7.50		1.5
25	48.00			0.33			37.79								7.60		1.5
26	49.00			0.32			55.60								7.60		1.5
27	26.00			0.31			40.52								7.60		1.5
28	29.00			0.56			40.72								7.60		1.5
29	31.00			0.47			41.82								7.50		1.5
30	50.00			0.42			40.85								7.50		1.5
31	32.00			0.75			49.49								7.50		1.5

TABLE 2.1: PARTICULATE REMOVAL PROFILE (JANUARY 1987)

DATE	TURBIDITY (FTU)				COLOUR (TCU)		COAGULANT	COAG. AID	(1)	(2)	(3)	(4)	METAL RES. Al/Fe (mg/L)		pH		TEMP DEG. C.
	Raw	Set.	Filter	Treat.	Raw	Treat.	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Raw	Treat.	Raw	Treat.	
1	27.00			0.28			37.59								7.50		1.5
2	23.00			0.44			40.59								7.50		1.5
3	20.00			0.17			38.76								7.50		1.5
4	25.00			0.40			39.41								7.50		1.5
5	23.00			0.30			39.41								7.60		2.0
6	10.00			0.36			40.00								7.60		2.0
7	12.00			0.43			38.24								7.60		2.0
8	38.00			0.92			42.65								7.50		2.0
9	31.00			0.38			37.29								7.50		2.0
10	34.00			0.72			45.18								7.50		2.0
11	30.00			0.25			40.59								7.60		1.5
12	38.00			0.28			40.18								7.60		1.0
13	48.00			0.24			38.82								7.60		1.0
14	25.00			1.00			39.65								7.60		1.5
15	22.00			0.37			44.41								7.60		1.5
16	40.00			0.72			44.06								7.60		1.5
17	28.00			0.45			44.82								7.60		1.5
18	27.00			0.95			42.71								7.60		1.5
19	25.00			1.00			41.18								7.60		1.5
20	31.00			0.53			41.18								7.50		1.5
21	32.00			0.41			42.06								7.50		1.5
22	21.00			0.60			43.47								7.60		1.0
23	16.00			0.20			40.41								7.60		1.0
24	12.00			0.30			42.65								7.60		1.0
25	11.00			0.23			28.53								7.50		1.0
26	10.00			0.22			30.82								7.50		1.0
27	11.00			0.55			30.35								7.40		1.5
28	6.50			0.11			30.24								7.40		1.5
29	5.50			0.27			31.71								7.40		2.0
30	4.00			0.30			25.47								7.40		2.0
31	5.00			0.35			31.00								7.40		2.0

TABLE 2.1: PARTICULATE REMOVAL PROFILE (FEBRUARY 1987)

DATE	TURBIDITY (FTU)				COLOUR (TCU)		COAGULANT	COAG. AID	(1)	(2)	(3)	(4)	METAL RES. Al/Fe (mg/L)		pH		TEMP DEG. C.
	Raw	Set.	Filter	Treat.	Raw	Treat.	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Raw	Treat.	Raw	Treat.	
1	4.00			0.30			28.06								7.40		1.5
2	3.40			0.24			27.82								7.40		1.5
3	3.70			0.24			28.59								7.80		1.5
4	3.00			0.22			26.18								7.60		1.5
5	2.70			0.15			27.18								7.80		1.5
6	2.50			0.24			25.53								7.70		1.5
7	3.00			0.22			19.16								7.60		1.0
8	2.60			0.21			19.94								7.60		1.0
9	3.00			0.35			22.18								7.60		1.0
10	2.90			0.90			21.35								7.80		1.5
11	1.80			0.17			21.12								7.80		1.5
12	2.50			0.48			21.76								7.60		1.5
13	1.90			0.55			20.47								7.60		2.0
14	2.30			0.30			22.00								7.60		2.0
15	1.90			0.60			20.88								7.60		2.0
16	2.00			0.74			20.12								7.80		2.0
17	2.20			0.17			19.76								7.60		2.0
18	2.20			0.19			19.59								7.80		2.0
19	3.60			0.20			21.71								7.80		2.0
20	2.50			0.50			18.06								7.80		2.0
21	2.80			0.62			20.00								7.60		2.5
22	3.10			0.23			20.88								7.80		1.5
23	2.30			0.19			18.88								7.60		3.0
24	3.20			0.24			23.88								7.80		3.0
25	2.80			0.12			20.65								7.60		3.5
26	3.40			0.17			16.12								7.60		4.0
27	3.50			0.28			21.41								7.60		3.0
28	3.40			0.18			20.35								7.50		2.0
29																	
30																	
31																	

TABLE 2.1: PARTICULATE REMOVAL PROFILE (MARCH 1987)

DATE	TURBIDITY (FTU)				COLOUR (TCU)		COAGULANT	COAG. AID	(1)	(2)	(3)	(4)	METAL RES. Al/Fe (mg/L)		pH		TEMP DEG. C.
	Raw	Set.	Filter	Treat.	Raw	Treat.	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Raw	Treat.	Raw	Treat.	
1	2.80			0.16			21.18								7.60		2.0
2	4.20			0.24			25.24								7.60		2.0
3	10.30			0.46			23.29								7.60		2.0
4	14.10			0.37			24.35								7.60		2.0
5	14.40			0.34			21.88								7.60		1.5
6	11.70			0.85			22.59								7.60		1.5
7	8.60			0.48			21.00								7.60		1.5
8	10.20			0.50			22.59								7.60		2.5
9	15.50			0.53			34.41								7.70		3.5
10	45.00			1.00			35.88								7.70		2.0
11	75.00			1.00			41.71								7.60		1.0
12	80.00			1.00			47.71								7.60		1.0
13	85.00			1.00			47.53								7.60		1.5
14	57.00			1.00			51.82								7.60		2.0
15	69.00			1.00			50.24								7.60		2.0
16	48.00			1.00			28.12								7.60		2.0
17	27.00			1.00			82.88								7.60		2.0
18	60.00			1.00			49.41								7.60		2.0
19	25.00			1.00			49.06								7.60		3.0
20	39.00			1.00			49.24								7.60		3.0
21	29.00			1.00			44.76								7.60		3.0
22	28.00			1.00			48.76								7.40		4.0
23	31.00			1.00			41.88								7.60		5.0
24	26.00			1.00			50.53								7.60		6.0
25	22.00			1.00			46.47								7.60		6.0
26	24.00			1.00			47.94								7.60		7.0
27	25.00			0.90			42.88								7.60		7.0
28	21.00			1.00			46.29								7.60		7.0
29	23.00			1.00			50.18								7.60		7.0
30	35.00			1.00			46.06								7.40		8.0
31	38.00			1.00			49.82								7.60		

TABLE 2.1: PARTICULATE REMOVAL PROFILE (APRIL 1987)

DATE	TURBIDITY (FTU)				COLOUR (TCU)		COAGULANT	COAG. AID	(1)	(2)	(3)	(4)	METAL RES. Al/Fe (mg/L)		pH		TEMP DEG. C.
	Raw	Set.	Filter	Treat.	Raw	Treat.	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Raw	Treat.	Raw	Treat.	
1	44.00			1.00			49.82								7.60		7.0
2	55.00			1.00			51.49								7.60		6.0
3	50.00			1.00			49.37								7.60		5.0
4	95.00			1.00			48.38								7.60		5.0
5	72.00			1.00			65.26								7.60		5.0
6	80.00			1.00			49.65								7.60		5.0
7	78.00			0.95			49.14								7.60		4.0
8	60.00			0.46			48.69								7.60		5.0
9	51.00			0.42			49.55								7.60		5.0
10	53.00			0.35			50.90								7.60		5.5
11	37.00			0.20			49.78								7.60		6.0
12	35.00			0.25			46.46								7.60		7.0
13	34.00			0.24			45.77								7.60		8.0
14	34.00			0.30			49.46								7.60		7.0
15	40.00			0.59			49.89								7.60		9.0
16	25.00			0.31			50.41								7.60		9.0
17	25.00			0.20			44.91								7.60		9.0
18	18.00			0.40			50.00								7.60		9.0
19	17.00			0.30			46.82								7.60		9.0
20	17.00			0.25			50.43								7.60		9.0
21	14.00			0.30			50.27								7.60		9.0
22	24.00			0.28			49.50								7.60		11.0
23	32.00			0.29			52.60								7.60		11.0
24	29.00			0.23			47.06								7.60		11.0
25	38.00			0.20			47.91								7.80		11.0
26	30.00			0.21			45.94								7.60		11.0
27	20.00			0.45			48.42								7.60		11.0
28	20.00			0.36			50.76								7.60		12.0
29	27.00			0.29			48.72								7.60		12.0
30	26.00			0.53			47.65								7.80		12.0
31																	

TABLE 2.1: PARTICULATE REMOVAL PROFILE (MAY 1987)

DATE	TURBIDITY (FTU)				COLOUR (TCU)		COAGULANT	COAG. AID	(1)	(2)	(3)	(4)	METAL RES. Al/Fe (mg/L)		pH		TEMP DEG. C.
	Raw	Set.	Filter	Treat.	Raw	Treat.	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Raw	Treat.	Raw	Treat.	
1	24.00			0.25			48.76								7.60		11.0
2	26.00			0.25			45.33								7.60		11.0
3	19.00			0.34			40.53								7.60		11.0
4	18.00			0.30			42.86								7.60		11.0
5	20.00			0.29			48.72								7.80		11.0
6	15.00			0.25			46.51								7.70		11.0
7	19.00			0.24			42.81								7.80		12.5
8	32.00			0.45			37.41								7.60		12.5
9	21.00			0.25			30.74								7.40		13.5
10	25.00			0.26			35.94								7.60		14.0
11	20.00			0.24			34.33								7.60		14.0
12	15.00			0.14			39.33								7.60		14.0
13	14.00			0.32			34.22								7.60		14.0
14	19.00			0.15			31.00								7.60		15.0
15	26.00			0.24			39.03								7.60		15.0
16	24.00			0.19			38.25								7.40		15.0
17	23.00			0.15			36.87								7.60		15.0
18	21.00			0.17			33.08								7.60		15.5
19	11.00			0.20			29.93								7.60		16.0
20	9.00			0.15			28.15								7.60		16.0
21	11.00			0.10			28.32								7.60		16.0
22	9.00			0.08			20.21								7.60		16.0
23	10.00			0.30			26.02								7.60		17.0
24	14.00			0.15			27.44								7.60		16.0
25	11 00			0.10			24.93								7.60		16.5
26	9.00			0.19			25.08								7.60		17.0
27	8.00			0.12			21.80								7.60		17.0
28	8.00			0.32			26.02								7.60		18.0
29	7.00			0.13			27.76								7.60		18.5
30	7.00			0.15			28.59								7.60		20.0
31	7.00			0.14			36.69								7.60		21.0

TABLE 2.1: PARTICULATE REMOVAL PROFILE (JUNE 1987)

DATE	TURBIDITY (FTU)				COLOUR (TCU)		COAGULANT	COAG. AID	(1)	(2)	(3)	(4)	METAL RES. Al/Fe (mg/L)		pH		TEMP DEG. C.
	Raw	Set.	Filter	Treat.	Raw	Treat.	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Raw	Treat.	Raw	Treat.	
1	6.00			0.22			25.69								7.60		21.0
2	6.00			0.23			21.79								7.60		21.0
3	5.00			0.18			25.99								7.60		21.0
4	5.00			0.10			25.56								7.60		20.0
5	12.00			0.12			23.55								7.60		20.0
6	19.00			0.14			28.53								7.40		20.0
7	20.00			0.15			24.03								7.40		20.0
8	12.00			0.14			27.49								7.60		20.0
9	18.00			0.27			26.29								7.60		20.0
10	13.00			0.22			22.34								7.80		20.0
11	12.00			0.13			20.18								7.80		19.0
12	13.00			0.12			21.48								7.60		19.0
13	16.00			0.28			23.04								7.60		20.0
14	15.00			0.13			22.34								7.60		20.0
15	14.00			0.18			27.13								7.60		20.0
16	25.00			0.15			26.94								7.60		21.0
17	16.00			0.14			25.72								7.60		22.0
18	16.00			0.18			27.78								7.80		23.0
19	17.00			0.08			26.43								7.70		23.0
20	18.00			0.08			23.32								7.80		23.0
21	17.00			0.09			33.02								7.80		23.0
22	21.00			0.14			26.06								7.80		23.0
23	14.00			0.40			26.87								7.70		23.0
24	15.00			0.25			26.43								7.80		23.0
25	16.00			0.19			26.07								7.80		23.0
26	14.00			0.23			28.23								7.80		23.0
27	11.00			0.23			26.10								7.80		23.0
28	23.00			0.10			26.75								7.80		22.0
29	18.00			0.35			26.60								7.80		21.0
30	14.00			0.11			26.93								7.80		21.0
31																	

TABLE 2.1: PARTICULATE REMOVAL PROFILE (JULY 1987)

DATE	TURBIDITY (FTU)				COLOUR (TCU)		COAGULANT	COAG. AID	(1)	(2)	(3)	(4)	METAL RES. Al/Fe (mg/L)		pH		TEMP DEG. C.
	Raw	Set.	Filter	Treat.	Raw	Treat.	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Raw	Treat.	Raw	Treat.	
1	20.00			0.18			26.75								7.80		21.0
2	12.00			0.19			24.94								7.80		21.0
3	15.00			0.15			26.42								7.80		21.0
4	40.00			0.15			24.90								7.80		21.0
5	25.00			0.20			25.85								7.80		21.5
6	12.00			0.32			26.06								7.60		21.0
7	11.00			0.22			29.00								7.80		22.0
8	11.00			0.07			27.23								7.80		22.0
9	24.00			0.24			28.15								7.80		22.0
10	28.00			0.18			24.52								7.80		24.0
11	14.00			0.19			25.54								7.60		24.0
12	19.00			0.20			34.57								7.60		25.0
13	11.00			0.42			26.37								7.80		25.0
14	14.00			0.10			26.12								7.80		25.0
15	65.00			0.11			21.91								7.80		24.0
16	24.00			0.08			33.19								7.80		23.0
17	22.00			0.18			24.40								7.80		23.0
18	33.00			0.24			23.70								7.80		23.0
19	28.00			0.18			25.85								7.80		24.0
20	27.00			0.20			26.41								7.80		25.0
21	15.00			0.10			25.63								7.80		25.0
22	18.00			0.15			26.74								7.80		25.0
23	14.00			0.13			25.91								7.80		26.0
24	13.00			0.25			24.73								7.80		26.0
25	13.00			0.26			99.90								7.80		26.0
26	12.00			0.25			26.78								7.80		26.0
27	16.00			0.15			24.03								7.80		26.0
28	14.00			0.10			26.83								7.80		26.0
29	10.00			0.11			26.38								7.60		26.0
30	11.00			0.16			27.92								7.60		26.0
31	8.00			0.31			26.78								7.60		26.0

TABLE 2.1: PARTICULATE REMOVAL PROFILE (AUGUST 1987)

DATE	TURBIDITY (FTU)				COLOUR (TCU)		COAGULANT	COAG. AID	(1)	(2)	(3)	(4)	METAL RES. Al/Fe (mg/L)		pH		TEMP DEG. C.
	Raw	Set.	Filter	Treat.	Raw	Treat.	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Raw	Treat.	Raw	Treat.	
1	10.00			0.28			29.60								7.60		26.0
2	12.00			0.24			28.56								7.60		26.0
3	9.00			0.30			25.47								7.60		26.0
4	12.00			0.54			28.51								7.60		26.0
5	11.00			0.19			26.82								7.60		26.0
6	10.00			0.13			25.92								7.60		25.0
7	11.00			0.25			27.23								7.60		25.0
8	12.00			0.28			28.28								7.80		25.0
9	11.00			0.29			26.05								7.80		25.0
10	7.00			0.32			32.68								7.80		25.0
11	8.00			0.46			24.87								7.80		25.0
12	6.00			0.49			24.99								7.80		24.0
13	7.00			0.41			23.11								7.70		24.0
14	6.00			0.44			22.61								7.80		24.0
15	6.00			0.39			25.94								7.80		24.0
16	6.00			0.39			28.28								7.80		25.0
17	10.00			0.38			23.39								7.80		25.0
18	11.00			0.15			26.86								7.80		25.0
19	17.00			0.18			16.16								7.80		25.0
20	16.00			0.53			44.46								7.80		25.0
21	9.00			0.57			28.12								7.80		25.0
22	19.00			0.37			28.24								7.80		24.0
23	18.00			0.47			28.63								7.80		23.0
24	18.00			0.95			20.42								7.80		22.0
25	19.00			0.53			25.08								7.80		22.0
26	8.00			0.43			23.80								7.80		22.0
27	12.00			0.33			24.79								7.80		21.0
28	11.00			0.28			25.08								7.80		20.0
29	11.00			0.15			24.51								7.80		20.0
30	9.00			0.10			24.25								7.80		20.0
31	7.00			0.06			24.92								7.80		20.0

TABLE 2.1: PARTICULATE REMOVAL PROFILE (SEPTEMBER 1987)

DATE	TURBIDITY (FTU)				COLOUR (TCU)		COAGULANT	COAG. AID	(1)	(2)	(3)	(4)	METAL RES. Al/Fe (mg/L)		pH		TEMP DEG. C.
	Raw	Set.	Filter	Treat.	Raw	Treat.	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Raw	Treat.	Raw	Treat.	
1	16.00			0.25			23.49								7.80		20.5
2	14.00			0.39			5.07								7.80		20.0
3	8.00			0.95			20.94								7.80		20.0
4	9.00			0.29			25.11								7.80		19.0
5	10.00			0.30			27.21								7.80		19.0
6	10.00			0.27			26.68								7.80		19.0
7	10.00			0.30			20.23								7.80		19.0
8	9.00			0.47			26.98								7.80		20.0
9	9.00			0.25			24.02								7.80		20.0
10	9.00			0.15			25.16								7.80		21.0
11	10.00			0.15			25.30								7.80		21.0
12	9.00			0.33			24.69								7.80		21.0
13	10.00			0.28			26.04								7.80		21.0
14	9.00			0.34			27.24								7.80		21.0
15	12.00			0.37			23.83								7.80		21.0
16	7.00			0.44			25.74								7.80		21.0
17	7.00			0.27			27.75								7.80		21.0
18	8.00			0.29			24.69								7.80		21.0
19	8.00			0.42			26.13								7.80		21.0
20	8.00			0.35			26.70								7.80		21.0
21	7.00			0.27			24.04								7.80		20.0
22	7.00			0.44			25.61								7.80		20.0
23	9.00			0.41			24.13								7.80		20.0
24	17.00			0.25			25.59								7.80		19.0
25	25.00			0.25			23.85								7.80		19.0
26	24.00			0.25			22.97								7.80		18.5
27	18.00			0.25			26.86								7.60		18.0
28	10.00			0.16			22.70								7.60		18.0
29	8.00			0.17			26.42								7.60		18.0
30	8.00			0.25			25.48								7.60		18.0
31																	

WATER PLANT OPTIMIZATION STUDY
STONEY POINT WATER TREATMENT PLANT

TABLE 2.1: PARTICULATE REMOVAL PROFILE (OCTOBER 1987)

DATE	TURBIDITY (FTU)				COLOUR (TCU)		COAGULANT	COAG. AID	(1)	(2)	(3)	(4)	METAL RES. Al/Fe (mg/L)		pH		TEMP DEG. C.
	Raw	Set.	Filter	Treat.	Raw	Treat.	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Raw	Treat.	Raw	Treat.	
1	27.00			0.35			26.50								7.80		17.5
2	22.00			0.38			24.47								7.80		16.0
3	23.00			0.43			23.92								7.80		16.0
4	25.00			0.50			25.47								7.80		15.0
5	37.00			0.78			30.24								7.80		14.0
6	29.00			0.49			36.72								7.80		14.0
7	28.00			0.38			26.64								7.80		14.0
8	33.00			0.41			31.98								7.60		13.0
9	31.00			0.37			28.00								7.60		12.0
10	29.00			0.31			29.73								7.60		12.0
11	29.00			0.42			33.48								7.60		12.0
12	20.00			0.32			32.89								7.60		12.0
13	17.00			0.20			26.02								7.60		11.5
14	13.00			0.22			33.25								7.60		11.5
15	16.00			0.38			36.93								7.60		11.5
16	11.00			0.25			25.00								7.60		11.5
17	12.00			0.20			25.37								7.60		11.5
18	15.00			0.21			24.33								7.60		11.5
19	12.00			0.20			25.80								7.60		11.0
20	12.00			0.23			25.88								7.80		11.0
21	18.00			0.20			24.70								7.80		11.0
22	21.00			0.16			25.39								7.80		10.0
23	19.00			0.38			26.16								7.80		10.0
24	21.00			0.34			25.17								7.80		10.0
25	19.00			0.30			22.42								7.80		10.0
26	14.00			0.32			46.27								7.80		10.0
27	10.00			0.12			28.12								7.80		10.0
28	9.00			0.19			23.77								7.50		9.5
29	15.00			0.15			24.34								7.60		9.5
30	11.00			0.23			26.70								7.60		9.5
31	12.00			0.35			24.03								7.60		9.5

TABLE 2.1: PARTICULATE REMOVAL PROFILE (NOVEMBER 1987)

DATE	TURBIDITY (FTU)				COLOUR (TCU)		COAGULANT	COAG. AID	(1)	(2)	(3)	(4)	METAL RES. Al/Fe (mg/L)		pH		TEMP DEG. C.
	Raw	Set.	Filter	Treat.	Raw	Treat.	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Raw	Treat.	Raw	Treat.	
1	10.00			0.35			24.17								7.60		9.5
2	10.00			0.60			25.80								7.70		9.5
3	12.00			0.48			25.59								7.70		9.5
4	8.00			0.34			24.70								7.70		9.5
5	10.00			0.30			26.99								7.70		9.5
6	26.00			0.45			28.68								7.70		9.5
7	18.00			0.12			27.17								7.80		9.0
8	12.00			0.09			34.48								7.80		9.0
9	16.00			0.13			25.89								7.80		9.0
10	21.00			0.32			24.98								7.80		9.0
11	17.00			0.30			28.14								7.80		8.0
12	11.00			0.42			24.00								7.80		7.5
13	13.00			0.21			25.14								7.80		7.0
14	12.00			0.18			25.11								7.80		7.0
15	11.00			0.48			24.28								7.60		7.0
16	13.00			0.35			26.66								7.60		7.0
17	12.00			0.41			25.22								7.60		7.0
18	18.00			0.27			26.84								7.60		8.0
19	17.00			0.44			27.04								7.60		7.0
20	18.00			0.54			27.08								7.70		7.0
21	19.00			0.24			26.72								7.60		7.0
22	29.00			0.80			29.52								7.70		6.0
23	30.00			0.85			26.38								7.80		5.0
24	31.00			0.30			29.89								7.80		4.5
25	28.00			0.80			25.12								7.60		5.0
26	30.00			0.52			27.78								7.60		5.0
27	26.00			0.70			28.44								7.60		5.0
28	80.00			0.68			29.67								7.60		5.0
29	54.00			0.99			18.21								7.60		5.0
30	97.00						30.52								7.60		5.0
31																	

TABLE 2.1: PARTICULATE REMOVAL PROFILE (DECEMBER 1987)

DATE	TURBIDITY (FTU)				COLOUR (TCU)		COAGULANT	COAG. AID	(1)	(2)	(3)	(4)	METAL RES. Al/Fe (mg/L)		pH		TEMP DEG. C.
	Raw	Set.	Filter	Treat.	Raw	Treat.	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Raw	Treat.	Raw	Treat.	
1	70.00			0.95			30.42								7.60		6.0
2	35.00			0.95			33.75								7.60		5.5
3	47.00			0.83			25.56								7.60		5.0
4	30.00			0.72			53.76								7.80		4.5
5	30.00			0.40			45.68								7.80		4.5
6	31.00			0.52			35.78								7.60		4.0
7	40.00			0.95			38.42								7.60		4.0
8	25.00			0.96			39.53								7.60		3.5
9	23.00			1.00			39.26								7.60		4.0
10	28.00			1.00			41.09								7.60		4.0
11	31.00			1.00			38.78								7.60		4.0
12	29.00			1.00			39.00								7.60		5.0
13	27.00			0.95			39.08								7.60		5.0
14	24.00			0.98			37.63								7.60		4.0
15	23.00			0.95			41.35								7.60		4.0
16	48.00			1.00			40.52								7.60		4.0
17	52.00			0.95			40.24								7.60		4.0
18	43.00			0.40			43.52								7.60		3.0
19	43.00			0.85			39.56								7.80		3.0
20	60.00			0.98			53.37								7.80		2.0
21	59.00			4.70			52.35								7.80		2.5
22	55.00			2.40			53.42								7.80		2.5
23	40.00			2.30			50.00								7.80		2.5
24	35.00			2.50			45.43								7.80		2.5
25	90.00			1.50			50.20								7.80		2.5
26	45.00			1.80			46.27								7.80		2.5
27	40.00			2.50			46.69								7.80		2.5
28	42.00			0.95			47.48								7.80		2.0
29	110.00			1.75			46.14								7.80		2.0
30	85.00			3.80			44.61								7.80		2.0
31	80.00			4.30			46.21								7.80		2.0

TABLE 3.0: DISINFECTION SUMMARY

		1987						1986						1985					
	CHEMICAL	PRE-CHLORINATION			POST-CHLORINATION			PRE-CHLORINATION			POST-CHLORINATION			PRE-CHLORINATION			POST-CHLORINATION		
		MAX	MIN.	AVG.	MAX.	MIN.	AVG.	MAX.	MIN.	AVG.	MAX.	MIN.	AVG.	MAX.	MIN.	AVG.	MAX.	MIN.	AVG.
JAN	Cl2 Demand																		
	Cl2 Dosage				2.17	1.11	1.72				3.41	0.69	1.76				3.65	1.10	1.98
	Ammonia																		
	SO2																		
	Resid. Cl2 Free				1.50	1.00	1.39				1.50	0.90	1.43				1.50	0.50	1.20
	Resid. Cl2 Comb.																		
	Resid Cl2 Total																		
	F-Dosage																		
	F-Res.																		
FEB	Cl2 Demand																		
	Cl2 Dosage				2.38	0.98	1.48				5.38	1.12	2.37				2.16	0.76	1.78
	Ammonia																		
	SO2																		
	Resid. Cl2 Free				1.50	1.00	1.35				1.50	0.60	1.30				1.50	0.75	1.28
	Resid. Cl2 Comb.																		
	Resid. Cl2 Total																		
	F-Dosage																		
	F-Res.																		
MAR	Cl2 Demand																		
	Cl2 Dosage				4.92	1.50	2.41				5.09	2.05	3.44				5.02	1.32	2.73
	Ammonia																		
	SO2																		
	Resid Cl2 Free				1.50	0.50	1.23				1.50	0.70	1.39				1.70	0.50	1.30
	Resid. Cl2 Comb.																		
	Resid. Cl2 Total																		
	F-Dosage																		
	F-Res																		

WATER PLANT OPTIMIZATION STUDY
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TABLE 3.0: DISINFECTION SUMMARY

		1987						1986						1985					
	CHEMICAL	PRE-CHLORINATION			POST-CHLORINATION			PRE-CHLORINATION			POST CHLONINATION			PRE-CHLORINATION			POST-CHLORINATION		
		MAX	MIN	AVG.	MAX.	MIN.	AVG.	MAX.	MIN.	AVG.	MAX.	MIN.	AVG.	MAX.	MIN.	AVG.	MAX.	MIN.	AVG.
APR	Cl2 Demand																		
	Cl2 Dosage				2.89	1.18	2.01				4.56	1.17	1.90				3.64	1.13	2.06
	Ammonia																		
	SO2																		
	Resid Cl2 Free				1.50	0.50	1.47				1.50	0.80	1.36				1.60	0.70	1.28
	Resid. Cl2 Comb																		
	Resid. Cl2 Total																		
	F Dosage																		
	F Res.																		
MAY	Cl2 Demand																		
	Cl2 Dosage				2.00	1.14	1.54				2.50	0.99	1.64				2.63	0.94	1.62
	Ammonia																		
	SO2																		
	Resid Cl2 Free				1.50	1.00	1.48				1.50	0.60	1.35				1.50	0.60	1.28
	Resid. Cl2 Comb																		
	Resid. Cl2 Total																		
	F Dosage																		
	F Res.																		
JUN	Cl2 Demand																		
	Cl2 Dosage				2.33	1.00	1.52				3.06	1.27	1.98				2.34	1.20	1.58
	Ammonia																		
	SO2																		
	Resid Cl2 Free				1.50	1.20	1.49				1.50	1.40	1.48				1.50	0.65	1.35
	Resid. Cl2 Comb																		
	Resid. Cl2 Total																		
	F Dosage																		
	F Res																		

TABLE 3.0: DISINFECTION SUMMARY

		1987						1986						1985					
	CHEMICAL	PRE-CHLORINATION			POST-CHLORINATION			PRE-CHLORINATION			POST-CHLORINATION			PRE-CHLORINATION			POST-CHLORINATION		
		MAX.	MIN.	AVG.	MAX.	MIN.	AVG.	MAX.	MIN.	AVG.	MAX.	MIN.	AVG.	MAX.	MIN.	AVG.	MAX.	MIN.	AVG.
JUL	C12 Demand																		
	C12 Dosage				5.99	0.78	1.71				2.92	0.81	1.62				2.65	0.80	1.93
	Ammonia																		
	SO2																		
	Resid. C12 Free				1.50	0.80	1.46				1.50	0.50	1.45				1.50	0.50	1.39
	Resid. C12 Comb.																		
	Resid. C12 Total																		
	F-Dosage																		
	F-Res.																		
AUG	C12 Demand																		
	C12 Dosage				3.10	1.19	1.72				1.86	0.94	1.37				4.13	1.43	2.34
	Ammonia																		
	SO2																		
	Resid. C12 Free				1.50	0.60	1.37				1.50	1.00	1.43				1.50	1.00	1.48
	Resid. C12 Comb.																		
	Resid. C12 Total																		
	F-Dosage																		
	F-Res.																		
SEP	C12 Demand																		
	C12 Dosage				2.21	1.15	1.76				3.76	1.44	2.02				3.43	1.65	2.19
	Ammonia																		
	SO2																		
	Resid. C12 Free				1.50	1.20	1.49				1.50	0.50	1.45				1.50	1.40	1.49
	Resid. C12 Comb.																		
	Resid. C12 Total																		
	F-Dosage																		
	F Res.																		

WATER PLANT OPTIMIZATION STUDY
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TABLE 3.0: DISINFECTION SUMMARY

	CHEMICAL	1987						1986						1985					
		PRE-CHLORINATION			POST-CHLORINATION			PRE-CHLORINATION			POST-CHLORINATION			PRE-CHLORINATION			POST-CHLORINATION		
		MAX	MIN.	AVG.	MAX.	MIN.	AVG.	MAX.	MIN.	AVG.	MAX.	MIN.	AVG.	MAX.	MIN.	AVG.	MAX.	MIN.	AVG.
OCT	Cl2 Demand																4.75	0.98	2.03
	Cl2 Dosage				2.12	0.96	1.59				5.49	0.98	2.19						
	Ammonia																		
	SO2																		
	Resid. Cl2 Free				1.50	0.80	1.46				1.50	0.50	1.30				1.50	1.20	1.48
	Resid. Cl2 Comb																		
	Resid. Cl2 Total																		
	F Dosage																		
	F Res																		
NOV	Cl2 Demand																5.20	1.39	2.45
	Cl2 Dosage				2.64	1.20	1.63				2.97	1.12	1.97						
	Ammonia																		
	SO2																		
	Resid. Cl2 Free				1.50	0.80	1.32				1.50	1.00	1.44				1.50	0.65	1.38
	Resid. Cl2 Comb																		
	Resid. Cl2 Total																		
	F Dosage																		
	F Res.																		
DEC	Cl2 Demand																3.80	1.22	2.57
	Cl2 Dosage				3.50	1.50	1.95				3.25	1.11	1.90						
	Ammonia																		
	SO2																		
	Resid. Cl2 Free				1.50	0.50	1.38				1.50	0.50	1.34				1.50	1.00	1.40
	Resid. Cl2 Comb																		
	Resid. Cl2 Total																		
	F Dosage																		
	F Res																		

TABLE 3.1: DISINFECTION PROFILE (JAN 1985)

	PRE-CHLORINATION							POST-CHLORINATION							FLUORIDE		
DATE	Cl2		NH3	SO2	RESIDUAL Cl2			Cl2		NH3	SO2	RESIDUAL Cl2					DATE
	Dem.	Dos			Free	Comb.	Total	Dem.	Dos.			Free	Comb.	Total	Dos.	Res.	
1									1.10			1.50					1
2									3.65			0.50					2
3									2.86			1.50					3
4									2.20			1.50					4
5									1.93			1.50					5
6									1.75			1.50					6
7									2.21			1.50					7
8									1.66			1.20					8
9									2.97			1.30					9
10									3.00			1.00					10
11									1.93			1.50					11
12									1.96			1.50					12
13									2.50			1.40					13
14									2.99			0.80					14
15									1.99			1.50					15
16									1.69			1.50					16
17									2.10			1.00					17
18									2.17			1.40					18
19									1.29			0.65					19
20									2.96			0.65					20
21									2.11			0.90					21
22									1.22			0.75					22
23									1.30			0.85					23
24									1.44			1.50					24
25									1.61			1.40					25
26									1.44			0.90					26
27									1.44			1.00					27
28									1.37			1.40					28
29									1.64			1.50					29
30									1.31			0.65					30
31									1.66			1.40					31

TABLE 3.1: DISINFECTION PROFILE (APR 1985)

	PRE-CHLORINATION							POST-CHLORINATION							FLUORIDE		
DATE	Cl2		NH3	SO2	RESIDUAL Cl2			Cl2		NH3	SO2	RESIDUAL Cl2			Dos.	Res.	DATE
	Dem	Dos			Free	Comb.	Total	Dem.	Dos.			Free	Comb.	Total			
1									3.64			1.50					1
2									3.18			1.50					2
3									2.13			0.70					3
4									2.07			1.30					4
5									1.26			0.75					5
6									1.13			1.00					6
7									1.35			1.40					7
8									1.81			1.00					8
9									2.23			1.30					9
10									2.36			0.90					10
11									3.05			1.50					11
12									2.45			1.50					12
13									1.90			1.50					13
14									1.51			1.30					14
15									2.51			1.40					15
16									2.75			0.90					16
17									2.84			1.50					17
18									2.43			1.00					18
19									2.16			1.50					19
20									1.49			1.30					20
21									1.81			1.00					21
22									2.18			1.20					22
23									1.93			1.50					23
24									1.72			1.60					24
25									1.75			1.50					25
26									1.60			1.00					26
27									1.30			1.40					27
28									1.28			1.30					28
29									2.30			1.50					29
30									1.61			1.50					30
31																	31

TABLE 3.1: DISINFECTION PROFILE (JUL 1985)

DATE	PRE-CHLORINATION							POST-CHLORINATION							FLUORIDE		DATE
	Cl2		NH3	SO2	RESIDUAL Cl2			Cl2		NH3	SO2	RESIDUAL Cl2			Dos.	Res.	
	Dem.	Dos			Free	Comb.	Total	Dem.	Dos.			Free	Comb.	Total			
1									1.86			1.00					1
2									2.54			1.00					2
3									1.97			1.50					3
4									1.51			1.50					4
5									1.72			1.50					5
6									1.86			1.50					6
7									1.72			1.50					7
8									1.33			1.30					8
9									1.42			1.40					9
10									0.99			1.40					10
11									1.07			1.35					11
12									0.80			1.30					12
13									0.84			1.00					13
14									2.65			1.50					14
15									2.55			1.50					15
16									2.31			1.50					16
17									2.01			1.50					17
18									2.44			1.50					18
19									2.49			1.50					19
20									2.29			1.50					20
21									2.58			1.50					21
22									2.06			1.50					22
23									2.36			1.50					23
24									2.14			1.50					24
25									2.28			1.50					25
26									2.63			0.50					26
27									2.18			1.50					27
28									1.50			1.50					28
29									1.43			1.50					29
30									1.76			1.50					30
31									2.51			1.40					31

TABLE 3.1: DISINFECTION PROFILE (OCT 1985)

	PRE-CHLORINATION							POST-CHLORINATION						FLUORIDE		
DATE	Cl2		NH3	SO2	RESIDUAL Cl2			Cl2		NH3	SO2	RESIDUAL Cl2			Dos.	Res.	DATE
	Dem	Dos			Free	Comb.	Total	Dem.	Dos.			Free	Comb.	Total			
1									2.72			1.50					1
2									2.60			1.50					2
3									2.00			1.50					3
4									1.81			1.50					4
5									2.42			1.50					5
6									1.82			1.50					6
7									1.67			1.50					7
8									1.44			1.50					8
9									1.26			1.50					9
10									1.36			1.50					10
11									1.67			1.50					11
12									0.98			1.50					12
13									1.09			1.50					13
14									1.36			1.50					14
15									1.57			1.50					15
16									1.69			1.50					16
17									2.37			1.50					17
18									2.23			1.50					18
19									1.82			1.50					19
20									2.16			1.50					20
21									3.25			1.50					21
22									4.75			1.20					22
23									2.29			1.50					23
24									2.90			1.50					24
25									2.84			1.50					25
26									2.31			1.50					26
27									1.40			1.30					27
28									1.81			1.50					28
29									1.85			1.50					29
30									1.44			1.50					30
31									2.13			1.50					31

TABLE 3.1: DISINFECTION PROFILE (JAN 1986)

	PRE-CHLORINATION							POST-CHLORINATION							FLUORIDE		
DATE	Cl2		NH3	SO2	RESIDUAL Cl2			Cl2		NH3	SO2	RESIDUAL Cl2			Dos.	Res.	DATE
	Dem.	Dos.			Free	Comb.	Total	Dem.	Dos.			Free	Comb.	Total			
1									1.52			1.50					1
2									1.91			1.50					2
3									1.89			1.50					3
4									2.10			1.50					4
5									2.13			1.50					5
6									1.91			1.50					6
7									2.16			1.50					7
8									2.06			1.50					8
9									3.41			1.50					9
10									1.78			1.50					10
11									1.79			1.50					11
12									1.45			1.50					12
13									1.64			1.10					13
14									1.84			1.50					14
15									1.83			1.50					15
16									1.99			1.50					16
17									1.73			1.50					17
18									0.97			1.50					18
19									1.38			1.50					19
20									1.74			1.00					20
21									2.73			1.20					21
22									1.76			1.50					22
23									1.99			1.50					23
24									1.37			1.30					24
25									1.76			1.50					25
26									1.62			1.50					26
27									1.36			1.50					27
28									1.26			1.40					28
29									0.69			0.90					29
30									1.17			1.50					30
31																	31

TABLE 3.1: DISINFECTION PROFILE (APR 1986)

	PRE-CHLORINATION							POST-CHLORINATION							FLUORIDE		
DATE	Cl2		NH3	SO2	RESIDUAL Cl2			Cl2		NH3	SO2	RESIDUAL Cl2			Dos.	Res.	DATE
	Dem.	Dos			Free	Comb.	Total	Dem.	Dos.			Free	Comb.	Total			
1									1.88			1.50					1
2									2.35			1.50					2
3									2.34			1.50					3
4									2.06			1.30					4
5									1.79			1.50					5
6									1.50			1.50					6
7									1.59			1.50					7
8									1.90			1.20					8
9									2.39			1.25					9
10									1.96			1.50					10
11									1.81			1.20					11
12									1.50			1.50					12
13									1.17			1.30					13
14									1.28			1.40					14
15									1.59			1.50					15
16									1.45			1.30					16
17									1.47			1.10					17
18									1.43			1.50					18
19									1.34			1.50					19
20									1.38			1.50					20
21									4.56			1.50					21
22									2.40			1.50					22
23									1.98			1.50					23
24									1.81			1.10					24
25									2.09			1.20					25
26									1.75			1.50					26
27									2.21			0.80					27
28									2 01			1.50					28
29									1 88			1.00					29
30									1 99			1.20					30
31																	31

TABLE 3.1: DISINFECTION PROFILE (JUL 1986)

	PRE-CHLORINATION							POST-CHLORINATION							FLUORIDE		
DATE	C12		NH3	SO2	RESIDUAL C12			C12		NH3	SO2	RESIDUAL C12					DATE
	Dem.	Dos.			Free	Comb.	Total	Dem.	Dos.			Free	Comb.	Total	Dos.	Res.	
1									1.91			1.50					1
2									1.77			1.50					2
3									2.14			1.50					3
4									1.73			1.50					4
5									1.74			1.50					5
6									1.29			1.50					6
7									1.23			1.50					7
8									1.64			1.50					8
9									1.72			1.50					9
10									1.88			1.50					10
11									2.92			0.50					11
12									1.51			1.50					12
13									1.85			1.50					13
14									1.24			1.50					14
15									1.79			1.50					15
16									1.74			1.30					16
17									1.70			1.50					17
18									1.46			1.50					18
19									1.23			1.50					19
20									1.35			1.50					20
21									1.55			1.50					21
22									1.73			1.50					22
23									1.47			1.50					23
24									1.39			1.50					24
25									2.56			1.50					25
26									1.46			1.50					26
27									1.50			1.50					27
28									1.25			1.50					28
29									1.54			1.00					29
30									0.81			1.50					30
31									1.22			1.50					31

TABLE 3.1: DISINFECTION PROFILE (OCT 1986)

	PRE-CHLORINATION							POST-CHLORINATION							FLUORIDE		
DATE	C12		NH3	SO2	RESIDUAL C12			C12		NH3	SO2	RESIDUAL C12					DATE
	Dem	Dos			Free	Comb.	Total	Dem.	Dos.			Free	Comb.	Total	Dos.	Res.	
1									1.91			1.50					1
2									2.83			1.20					2
3									1.35			1.50					3
4									2.08			1.40					4
5									1.95			1.30					5
6									0.98			0.60					6
7									0.99			1.50					7
8									1.98			1.50					8
9									1.87			1.50					9
10									2.98			1.50					10
11									5.49			1.50					11
12									1.13			1.50					12
13									1.14			1.50					13
14									3.53			1.50					14
15									2.53			1.50					15
16									2.68			1.50					16
17									2.39			0.90					17
18									2.40			1.50					18
19									1.72			1.50					19
20									1.60			1.50					20
21									2.12			1.50					21
22									2.31			1.50					22
23									2.10			1.50					23
24									1.86			1.50					24
25									1.78			0.50					25
26									3.09			1.50					26
27									1.89			1.00					27
28									2.53			1.10					28
29									1.96			0.60					29
30									2.45			0.90					30
31									2.19			0.80					31

TABLE 3.1: DISINFECTION PROFILE (JAN 1987)

	PRE-CHLORINATION							POST-CHLORINATION							FLUORIDE		
DATE	Cl2		NH3	SO2	RESIDUAL Cl2			Cl2		NH3	SO2	RESIDUAL Cl2			Dos.	Res.	DATE
	Dem.	Dos.			Free	Comb.	Total	Dem.	Dos.			Free	Comb.	Total			
1									1.88			1.50					1
2									1.63			1.50					2
3									1.68			1.50					3
4									1.71			1.50					4
5									1.71			1.50					5
6									1.66			1.50					6
7									1.49			1.30					7
8									2.06			1.50					8
9									1.82			1.50					9
10									2.01			1.50					10
11									1.88			1.50					11
12									1.66			1.30					12
13									1.95			1.30					13
14									1.64			1.20					14
15									1.97			1.30					15
16									1.47			1.50					16
17									1.55			1.50					17
18									2.05			1.30					18
19									1.76			1.50					19
20									2.14			1.50					20
21									1.40			1.30					21
22									2.17			1.00					22
23									1.11			1.20					23
24									1.26			1.30					24
25									1.78			1.20					25
26									1.76			1.50					26
27									1.69			1.50					27
28									1.38			1.00					28
29									1.59			1.40					29
30									1.80			1.50					30
31									1.55			1.50					31

TABLE 3.1: DISINFECTION PROFILE (APR 1987)

	PRE-CHLORINATION							POST-CHLORINATION							FLUORIDE		
DATE	Cl2		NH3	SO2	RESIDUAL Cl2			Cl2		NH3	SO2	RESIDUAL Cl2			Dos.	Res.	DATE
	Dem	Dos.			Free	Comb.	Total	Dem	Dos.			Free	Comb.	Total			
1									2.21			1.50					1
2									2.84			1.50					2
3									2.86			1.50					3
4									1.70			1.50					4
5									2.89			1.50					5
6									2.68			1.50					6
7									2.85			1.50					7
8									1.87			1.50					8
9									1.98			1.50					9
10									2.69			1.50					10
11									2.25			1.50					11
12									2.06			1.50					12
13									1.94			1.50					13
14									2.47			1.50					14
15									2.18			0.50					15
16									2.71			1.50					16
17									1.36			1.50					17
18									1.47			1.50					18
19									2.01			1.50					19
20									1.53			1.50					20
21									1.44			1.50					21
22									1.55			1.50					22
23									1.70			1.50					23
24									1.46			1.50					24
25									1.18			1.50					25
26									1.65			1.50					26
27									1.76			1.50					27
28									1.56			1.50					28
29									2.02			1.50					29
30									1.44			1.50					30
31																	31

TABLE 3.1: DISINFECTION PROFILE (JUL 1987)

	PRE-CHLORINATION							POST-CHLORINATION							FLUORIDE		
DATE	Cl2		NH3	SO2	RESIDUAL Cl2			Cl2		NH3	SO2	RESIDUAL Cl2			Dos.	Res.	DATE
	Dem.	Dos.			Free	Comb.	Total	Dem.	Dos.			Free	Comb.	Total			
1									1.57			1.50					1
2									1.62			1.50					2
3									0.78			1.50					3
4									1.70			0.80					4
5									1.62			1.30					5
6									1.37			1.50					6
7									1.66			1.50					7
8									2.02			1.50					8
9									1.78			1.50					9
10									1.96			1.50					10
11									1.53			1.50					11
12									1.73			1.50					12
13									1.63			1.50					13
14									1.96			1.50					14
15									1.31			1.50					15
16									2.45			1.50					16
17									1.39			1.50					17
18									1.42			1.50					18
19									1.18			1.50					19
20									1.15			1.50					20
21									1.54			1.50					21
22									1.23			1.50					22
23									1.30			1.50					23
24									1.72			1.50					24
25									5.99			1.50					25
26									1.91			1.50					26
27									1.33			1.50					27
28									1.61			1.50					28
29									1.48			1.50					29
30									1.37			1.50					30
31									1.56			1.30					31

WATER PLANT OPTIMIZATION STUDY
STONEY POINT WATER SYSTEM

TABLE 3.1: DISINFECTION PROFILE (OCT 1987)

	PRE-CHLORINATION							POST-CHLORINATION							FLUORIDE		
DATE	Cl2		NH3	SO2	RESIDUAL Cl2			Cl2		NH3	SO2	RESIDUAL Cl2			Dos.	Res.	DATE
	Dem	Dos			Free	Comb.	Total	Dem.	Dos.			Free	Comb.	Total			
1									2.12			1.50					1
2									1.73			1.50					2
3									1.49			1.50					3
4									1.59			0.80					4
5									1.92			1.30					5
6									1.67			1.50					6
7									1.21			1.50					7
8									0.96			1.50					8
9									1.14			1.50					9
10									1.08			1.50					10
11									1.67			1.50					11
12									1.64			1.50					12
13									1.82			1.50					13
14									1.86			1.50					14
15									1.54			1.50					15
16									1.76			1.50					16
17									1.79			1.50					17
18									1.72			1.50					18
19									1.82			1.50					19
20									1.94			1.50					20
21									1.65			1.50					21
22									1.59			1.50					22
23									1.96			1.50					23
24									1.84			1.50					24
25									1.18			1.50					25
26									1.32			1.50					26
27									1.60			1.50					27
28									1.49			1.50					28
29									1.22			1.50					29
30									1.67			1.50					30
31									1.41			1.30					31

WATER PLANT OPTIMIZATION STUDY
AMHERSTBURG WATER SYSTEM

TABLE 4.0: T&O CONTROL ALKALINITY ADJ. &
FLUORIDATION SUMMARY

NO DATA AVAILABLE

TABLE 4.1: T&O CONTROL, ALKALINITY ADJ. & FLUORIDATION PROFILE

JAN 1984

NO DATA AVAILABLE

TABLE 5.0

WPOS Water Quality

No Data Available at Plant

WATER PLANT OPTIMIZATION STUDY
STONEY POINT WATER SYSTEM

TABLE 6.0: ALGAE COUNT

NO DATA AVAILABLE

WATER PLANT OPTIMIZATION STUDY
STONEY POINT WATER SYSTEM

TABLE 7.0: BACTERIOLOGICAL TESTING 1985

NO DATA AVAILABLE

WATER PLANT OPTIMIZATION STUDY
STONEY POINT WATER SYSTEM

TABLE 7.0: BACTERIOLOGICAL TESTING 1986

		TOTAL COLI				FECAL COLI				FECAL STREP			
		A	B	C	D	A	E	F	G	A	H	I	J
JAN	R							4					
	T	7				1				7			
FEB	R							2					
	T	9				9				9			
MAR	R							3					
	T	9				9				9			
APR	R							3					
	T	8				8				8			
MAY	R							3					
	T	9				9				9			
JUN	R							3					
	T	9				9				9			
JUL	R							3					
	T	9				9							
AUG	R							1					
	T	2				2				2			
SEP	R												
	T												
OCT	R												
	T												
NOV	R												
	T												
DEC	R							1					
	T	3				3				3			

ALL RESULTS ARE FOR 100mL SAMPLES;
TESTS CARRIED OUT AT WINDSOR PUBLIC
HEALTH LAB

A = ABSENT
B = 1-100
C = 101-5000
D = >5000
E = 0-10
F = 11-500
G = >500
H = 0-1
I = 2-50
J = >50

WATER PLANT OPTIMIZATION STUDY
STONEY POINT WATER SYSTEM

TABLE 7.0: BACTERIOLOGICAL TESTING 1987

		TOTAL COLI				FECAL COLI				FECAL STREP			
		A	B	C	D	A	E	F	G	A	H	I	J
JAN	R							2					
	T	8				9				9			
FEB	R							1					
	T	2				2							
MAR	R												
	T												
APR	R												
	T	3				3				3			
MAY	R												
	T	3				3				3			
JUN	R												
	T												
JUL	R							3					
	T	12				12				12			
AUG	R							2					
	T	4				4				4			
SEP	R												
	T	1				1				1			
OCT	R							1					
	T	3				3				3			
NOV	R							2					
	T	6				6				6			
DEC	R												
	T												

ALL RESULTS ARE FOR 100mL SAMPLES;
TESTS CARRIED OUT AT WINDSOR PUBLIC
HEALTH LAB

A = ABSENT
B = 1-100
C = 101-5000
D = >5000
E = 0-10
F = 11-500
G = >500
H = 0-1
I = 2-50
J = >50

Table 8

DWSP Results

STONEY POINT WATER TREATMENT PLANT DWSP RESULTS 06/15/87

PARAMETERS	UNITS		SAMPLE DATE 85/06/06	85/07/02	85/08/06	85/09/03	85/10/08	85/11/04	85/12/03	85/12/17	86/01/06	86/01/15	86/01/29	86/02/26	DETECTION LIMIT	DRINKING WATER OBJ
1,1 DICHLOROETHANE	UG/L	R	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W		.000 <W	.000 <W	.000 <W	.000 <W	0.10	10.000
		T	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 SPL	.000 <W		.000 <W	.000 <W	.000 <W		
1,1 DICHLOROETHYLENE	UG/L	R	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W		.000 <W	.000 <W	.000 <W	.000 <W	0.10	.300
		T	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 SPL	.000 <W		.000 <W	.000 <W	.000 <W		
1,2 DICHLOROBENZENE	UG/L	R	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W		.000 <W	.000 <W	.000 <W	.000 <W	0.05	400.000
		T	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 SPL	.000 <W		.000 <W	.000 <W	.000 <W		
1,2 DICHLOROETHANE	UG/L	R	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W		.000 <W	.000 <W	.000 <W	.000 <W	0.05	NONE
		T	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 SPL	.000 <W		.000 <W	.000 <W	.000 <W		
1,2 DICHLOROPROPANE	UG/L	R	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W		.000 <W	.000 <W	.000 <W	.000 <W	0.05	6.000
		T	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 SPL	.000 <W		.000 <W	.000 <W	.000 <W		
1,3 DICHLOROBENZENE	UG/L	R	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W		.000 <W	.000 <W	.000 <W	.000 <W	0.10	400.000
		T	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 SPL	.000 <W		.000 <W	.000 <W	.000 <W		
1,4 DICHLOROBENZENE	UG/L	R	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W		.000 <W	.000 <W	.000 <W	.000 <W	0.01	400.000
		T	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 SPL	.000 <W		.000 <W	.000 <W	.000 <W		
111, TRICHLOROETHANE	UG/L	R	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W		.000 <W	.000 <W	.000 <W	.000 <W	0.02	NONE
		T	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 SPL	.000 <W		.000 <W	.000 <W	.000 <W		
112 TRICHLOROETHANE	UG/L	R	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W		.000 <W	.000 <W	.000 <W	.000 <W	0.05	6.000
		T	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 SPL	.000 <W		.000 <W	.000 <W	.000 <W		
1122 T CHLOROETHANE	UG/L	R	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W		.000 <W	.000 <W	.000 <W	.000 <W	0.05	1.700
		T	000 <W	.000 <W	.000 <W	.000 <W	.000 <W	000 <W	.000 SPL	.000 <W		.000 <W	.000 <W	.000 <W		
123 TRICHLOROBENZENE	UG/L	R	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000	10000.000
		T	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	9.000 <I	15.000 <I	5.000 <W	5.000 <W	5.000 <W	5.000 <W		
1234 T CHLOROBENZENE	UG/L	R	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000	38000.000
		T	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	7.000 <I	1.000 <W	1.000 <W		

STONEY POINT WATER TREATMENT PLANT OWSP RESULTS 06/15/87

PARAMETERS	UNITS		SAMPLE DATE 85/06/06	85/07/02	85/08/06	85/09/03	85/10/08	85/11/04	85/12/05	85/12/17	86/01/06	86/01/15	86/01/29	86/02/26	DETECTION LIMIT	DRINKING WATER OBJ
1235 T-CHLOROBENZENE	NG/L	R	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000	15000.000
		T	1.000 <W	1.000 <W	1.000 <W	1.000 <W	25.000 <T	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W		
124 TRICHLOROBENZENE	NG/L	R	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000	NONE
		T	5.000 <W	5.000 <W	5.000 <W	39.000 <T	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W		
1245 T CHLOROBENZENE	NG/L	R	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000	58000.000
		T	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	5.000 <T	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W		
135 TRICHLOROBENZENE	NG/L	R	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000	10000.000
		T	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W		
2,4 D PROPIONIC ACID	NG/L	R		100.00 <W				100.00 <W							100.00	NONE
		T		100.00 <W				100.00 <W								
2,4,5-T	NG/L	R		50.000 <W				50.000 <W							50.00	NONE
		T		50.000 <W				50.000 <W								
2,4 D	NG/L	R		100.00 <W				100.00 <W							100.00	110000.000
		T		100.00 <W				100.00 <W								
234 TRICHLOROPHENOL	NG/L	R		100 00 <W				100 00 <W							100	NONE
		T		100.00 <W				100.00 <W								
2345 T-CHLOROPHENOL	NG/L	R		50.000 <W				50.000 <W							20	NONE
		T		50.000 <W				50.000 <W								
2356 T-CHLOROPHENOL	NG/L	R		50.000 <W				50.000 <W							10	NONE
		T		50.000 <W				50.000 <W								
236 TRICHLOROTOLUENE	NG/L	R	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000	NONE
		T	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	39.000 <T	5.000 <W	7.000 <T	5.000 <W	5.000 <W	50.000	23.000 <T		

STONEY POINT WATER TREATMENT PLANT DWSP RESULTS 06/15/07

PARAMETERS	UNITS		SAMPLE DATE 85/06/06	85/07/02	85/08/06	85/09/03	85/10/08	85/11/04	85/12/03	85/12/17	86/01/06	86/01/15	86/01/29	86/02/26	DETECTION LIMIT	DRINKING WATER OBJ
245 TRICHLOROTOLUENE	NG/L	A	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000	10000.000
		T	5.000 <W	5.000 <W	5.000 <W	20.000 <T	23.000 <T	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W		
245 TRICHLOROPHENOL	NG/L	A		50.000 <W				50.000 <W							100	NONE
		T		50.000 <W				50.000 <W								
246 TRICHLOROPHENOL	NG/L	A		50.000 <W				50.000 <W							20	10000.000
		T		50.000 <W				50.000 <W								
24DICHLOROPHENOXYBUTYRIC	NG/L	A		200.00 <W				200.00 <W							200.00	NONE
		T		200.00 <W				200.00 <W								
26A TRICHLOROTOLUENE	NG/L	A	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000	NONE
		T	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W		
ALDRIN	NG/L	A	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000	1400.000
		T	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W		
ALKALINITY	MG/L-CAC	A	105.00	91.800	86.600	83.400	91.800	84.200	120.00	104.40	114.60	115.40	98.000	196.80	0.2	NONE
		T	85.400	72.800	68.400	69.800	71.600	72.400	102.00	76.800	95.400	96.800	84.000	174.40		
ALPHA BHC	NG/L	A	1.000 <W	1.000 <W	1.000 <W	1.000 <W	2.000 <T	1.000 <W	2.000 <T	1.000 <W	1.000 <W	2.000 <T	3.000 <T	1.000 <W	1.000	700.000
		T	1.000 <W	1.000 <W	1.000 <W	1.000 <W	3.000 <T	4.000 <T	2.000 <T	3.000 <T	3.000 <T	3.000 <T	4.000 <T	1.000 <T		
ALPHA CHLORDANE	NG/L	A	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000	1400.000
		T	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W		
ALUMINUM	MG/L AL	A	2.100	.330	.250	.140	.450	.220	2.100	1.300	.061	.150	.240	.200	0.01	.100
		T	.075	.047	.048	.067	.002 <	.045	.150	.130	.180	.065	.086	.170		
AMETRINE	NG/L	A		50.000 <W				50.000 <W							50.00	NONE
		T						50.000 <W								
AMMONIUM TOTAL	MG/L N	A	.100 <I	.050 <W	.050 <W	.200 <I	.050 <W	.200 <I	.050 <I	.050 <W	.018	.004 <I	.016	.082	0.002	NONE
		T	.100 <I	.050 <W	.050 <W	.050 <W	.050 <W	.050 <W	.050 <W	.050 <D	.008	.008	.008	.006 <I		

STONEY POINT WATER TREATMENT PLANT DWSP RESULTS 06/15/07

PARAMETERS		UNITS		SAMPLE DATE 85/06/06	85/07/02	85/08/06	85/09/03	85/10/08	85/11/04	85/12/03	85/12/17	86/01/06	86/01/15	86/01/29	86/02/26	DETECTION LIMIT	DRINKING WATER OBJ
ARSENIC	MG/L-AS		R	.001 <	.001 <	.001 <	.001 <	.001	.001 <	.001	.001 <	.001 <	.001 <	.001 <	.001 <	0.001	.050
			T	.001 <	.001 <	.001 <	.001 <	.001 <	.001 <	.001 <	.001 <	.001 <	.001 <	.001 <	.001 <		
ATRAZINE	MG/L		R		50.000 <W				50.000 <W							50.00	46000.000
			T						50.000 <W								
BARIUM	MG/L-BA		R	.027	.017	.017	.017	.018	.018	.027	.018	.013	.015	.014	.025	0.001	1.000
			T	.013	.015	.017	.013	.007	.016	.015	.013	.016	.015	.012	.020		
BENZENE	UG/L		R	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W		.000 <W	.000 <W	.000 <W	.000 <W	0.05	10.000
			T	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 SPL	.000 <W		.000 <W	.000 <W	.000 <W		
BERYLLIUM	MG/L-BE		R	.001 <	.001 <	.001 <	.001 <	.001 <	.001 <	.001 <	.001 <	.001 <	.001 <	.001 <	.001 <	0.005	NONE
			T	.001 <	.001 <	.001 <	.001 <	.001 <	.001 <	.001 <	.001 <	.001 <	.001 <	.001 <	.001 <		
BETA RHC	MG/L		R	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000	700.000
			T	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W		
BLADER	MG/L		R		100.00 <W				100.00 <W							100.00	NONE
			T						100.00 <W								
BORON	MG/L-BO		R	.050	.310	.060	.020 <	.020 <	.020	.030	.040	.040	.060	.020 <	.060	0.005	5.000
			T	.020 <	.280	.090	.020 <	.020 <	.000	.040	.080	.040	.050	.030	.040		
BROMOFORM	UG/L		R	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W		.000 <W	.000 <W	.000 <W	.000 <W	0.2	700.000
			T	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 SPL	.000 <W		.000 <W	.000 <W	.000 <W		
CADMIUM	UG/L-CD		R	.300 <	.300 <	.300 <	.200 <	.200 <	.300 <	.200 <	.200 <	.200 <	.200 <	.200 <	.200 <	2.000	5.000
			T	.300 <	.300 <	.300 <	.200 <	.200 <	.300 <	.200 <	.200 <	.200 <	.200 <	.200 <	.200 <		
CALCIUM	MG/L-CA		R	35.000	26.000	27.600	35.000	31.000	28.500	49.000	39.500	42.000	43.500	35.600	61.000	0.2	NONE
			T	36.500	27.000	29.200	31.200	32.000	29.500	50.200	40.000	42.400	43.600	35.900	80.000		

SIDNEY POINT WATER TREATMENT PLANT OWSP RESULTS

06/15/07

PARAMETERS	UNITS		SAMPLE DATE 85/06/06	85/07/02	85/08/06	85/09/03	85/10/08	85/11/04	85/12/03	85/12/17	86/01/06	86/01/15	86/01/29	86/02/26	DETECTION LIMIT	DRINKING WATER OBJ
CARBON TETRACHLORIDE	UG/L	R	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	0.2	3.000
		T	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 SPL			.000 <W	.000 <W	.000 <W		
CHLORIDE	MG/L-CL	R	12.800	7.800	9.000	16.800	9.600	8.000	14.400	11.400	13.600	14.000	13.200	39.600	0.5	250.000
		T	14.200	10.800	17.600	13.600	12.200	10.800	16.400	13.200	16.200	15.000	14.400	42.200		
CHLOROBENZENE	UG/L	R	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	0.1	100.000
		T	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 SPL			.000 <W	.000 <W	.000 <W		
CHLORODIBROMOMETHANE	UG/L	R	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	10.000	.000 <W	.000 <W	.000 <W	.000 <W	0.1	353.000
		T	4.000	5.000	16.000	14.000	12.000	10.000	5.000 SPL			12.000	13.000	8.000		
CHLOROFORM	UG/L	R	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	37.000	.000 <W	.000 <W	.000 <W	.000 <W	0.1	350.000
		T	17.000	38.000	66.000	34.000	39.000	47.000	57.000 SPL			14.000	39.000	49.000		
CHROMIUM	MG/L CR	R	.003	.001	.001 <	.002	.001 <	.001	.006	.003	.002	.002	.002	.003	.5UG/L	50.000
		T	.001 <	.001 <	.001 <	.002	.001 <	.001 <	.002	.001	.002	.002	.002	.003		
CIS 1DIPENTE	UG/L	R												1.000 <W	1.000	NONE
		T												1.000 <W		
COBALT	MG/L-CO	R	.010	.017	.001 <	.001 <	.001 <	.001 <	.003	.002	.001 <	.001 <	.001 <	.001 <	.5UG/L	NONE
		T	.001 <	.001 <	.001 <	.001 <	.001 <	.001 <	.001 <	.001 <	.001 <	.001 <	.001 <	.001 <		
COLOUR		R	7.000	6.500	4.500	9.000	13.000	10.000	32.500	19.000					0.5	5.000
		T	1.000 <I	1.000 <I	.500 <I	.500 <I	.500 <W	.500 <I	2.000	.500 <I						
COLOUR	HIU	R									15.500	14.000	13.500	20.500	0.5	5.000
		T									.500 <I	.500 <W	1.500 <I	4.000		
CONDUCTIVITY	UMHO/CM	R	279.00	242.00	243.00	307.00	248.00	229.00	363.00	309.00	322.00	324.00	293.00	606.00	1.0	NONE
		T	296.00	256.00	266.00	283.00	259.00	243.00	385.00	323.00	329.00	346.00	300.00	600.00		
COPPER	MG/L-CU	R	.009	.014	.003	.004	.014	.019	.010	.009	.006	.007	.009	.011	5UG/L	1.000
		T	.001 <W	.002	.003	.004	.001 <	.002	.004	.004	.009	.004	.004	.007		

STONEY POINT WATER TREATMENT PLANT DWSP RESULTS 06/15/87

PARAMETERS		UNITS		SAMPLE DATE 85/06/06	85/07/02	85/08/06	85/09/03	85/10/08	85/11/04	85/12/03	85/12/17	86/01/08	86/01/15	86/01/29	86/02/26	DETECTION LIMIT	DRINKING WATER OBJ
CYANIDE	MG/L-CN	R		.001 <W	.001 <W	.001 <W	.001 <W	.001 <W	.001 <W	.001 <W	.001 <W	.001 <W	.001 <W	.001 <W	.001 <W	0.001	.400
		E		.001 <W	.001 <W	.001 <W	.001 <W	.001 <W	.001 <W	.001 <W	.001 <W	.001 <W	.001 <W	.001 <W	.001 <W		
DDD	MG/L	R		5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000	NONE
		T		5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W		
DI N BUTYL PHTHALATE	UG/L	R													1.000 <W	1.000	NONE
		E													1.000 <W		
DICAMBA	MG/L	R			100.00 <W				100.00 <W							100.00	NONE
		E			100.00 <W				100.00 <W								
DICHLOROBROMOMETHANE	UG/L	R		.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W		.000 <W	.000 <W	.000 <W	.000 <W	0.05	700.000
		T		10.000	14.000	18.000	18.000	15.000	15.000	12.000 SPL	14.000		7.000	17.000	16.000		
DIELDRIN	MG/L	R		2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000	1400.000
		E		2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W		
DIPHENYL ETHER	UG/L	R													1.000 <W	1.000	NONE
		E													1.000 <W		
ENDRIN	MG/L	R		4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000	400.000
		T		4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000 <W		
ETHYLBENZENE	UG/L	R		.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	0.05	1400.000
		T		.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 SPL			.000 <W	.000 <W	.000 <W		
FECAL COLIFORM MF	CT/100ML	R		4.000	.000	.000	1.000	1.000	8.000	12.000	21.000	.000	.000	.000	.000		.000
		T															
FLD CHLORINE (COMB)	MG/L-CL	R		.100	1.100	1.700	1.500		1.200	2.740		1.400		.100			NONE
		T															

STONEY POINT WATER TREATMENT PLANT DWSP RESULTS 06/15/87

PARAMETERS	UNITS		SAMPLE DATE 85/06/06	85/07/02	85/08/06	85/09/03	85/10/08	85/11/04	85/12/03	85/12/17	86/01/06	86/01/15	86/01/29	86/02/26	DETECTION LIMIT	DRINKING WATER OBJ
FLD CHLORINE (TOTAL)	MG/L CL	R	.500	1.300		1.500		1.650	1.200	1.000	1.900		.900	1.000		NONE
		T														
FLD CHLORINE FREE	MG/L CL	R	.400	.200	1.500	1.350	1.500	1.500	1.500		1.500	1.000	.800			NONE
		T														
FLD PH		R			7.800	7.650	7.800	7.650	7.800	7.900	7.400	7.800	7.800	7.800		NONE
		T			7.400	7.400	7.300	7.400	7.400	7.400	7.200	7.300	7.400	7.300		
FLD TEMPERATURE	DEG C	R	18.500	20.500	21.000	21.500	14.000	12.000	4.000	1.000	5.000	4.000	2.000	3.500		NONE
		T	18.500	20.500	21.000	21.500	14.000	11.500	4.000	2.000	5.500	5.000	5.000	4.000		
FLD TURBIDITY	FTU	R	62.000	14.000		58.000	30.000	18.000			5.000	3.000	5.000			NONE
		T	3.000	.100		.100			.040		1.000	.100	.200			
FLUORANTHENE	UG/L	R												1.000 <W	1.000	NONE
		T												1.000 <W		
FLUORIDE	MG/L F	R	.100	.090	.090	.170	.110	.100	.140	.110	.110	.120	.100	.170	0.01	2.400
		T	.080	.070	.070	.080	.070	.080	.080	.060	.110	.030 <I	.060	.140		
GAMMA CHLORDANE	NG/L	R	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000	7000.000
		T	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W		
HARDNESS	MG/L-CAC	R	124.00	97.000	102.00	127.70	110.00	102.00	166.00	137.00	148.00	151.00	126.00	270.00		500.000
		T	128.00	99.50	108.00	112.10	112.00	105.00	169.00	138.00	148.00	152.00	126.00	265.00		
HCB	NG/L	R	1.000 <W	1.000 <W	1.000 <W	5.000 <I	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000	NONE
		T	1.000 <W	1.000 <W	1.000 <W	5.000 <I	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W		
HEPTACHLOR	NG/L	R	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000	5000.000
		T	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W		
HEPTACHLOR EPOXIDE	NG/L	R	1.000 <W	1.000 <W	1.000 <W	2.000 <I	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000	6000.000
		T	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W		

STONEY POINT WATER TREATMENT PLANT OWSP RESULTS 06/15/87

PARAMETERS	UNITS		SAMPLE DATE 85/06/06	85/07/02	85/08/06	85/09/03	85/10/08	85/11/04	85/12/03	85/12/17	86/01/06	86/01/15	86/01/29	86/02/26	DETECTION LIMIT	DRINKING WATER OBJ
HEXACHLOROBUTADIENE	NG/L	R	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000	4500.000
		T	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	2.000 <I	1.000 <W	3.000 <I	1.000 <W	1.000 <W	1.000 <W	1.000 <W		
HEXACHLOROETHANE	NG/L	R	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000	19000.000
		T	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	2.000 <I		
HEXACHLOROPROPENE	UG/L	R												1.000 <W	1.000	NONE
		T												1.000 <W		
IRON	MG/L-FE	R	.020 <I	.400	.280	.190	.530	.350	2.100	.960	.006	.130	.210	.160	0.02	.300
		T	.010 <W	.012	.004	.003 <	.005	.007	.034	.015	.180	.003 <	.014	.013		
LEAD	MG/L-PB	R	.001 <	.003 <	.003 <	.003 <	.004	.003 <	.005	.004	.003 <	.003 <	.003 <	.003 <	0.005	.050
		T	.001 <	.003 <	.003 <	.003 <	.003 <	.005	.003 <	.003 <	.003 <	.003 <	.003 <	.003 <		
LINDANE	NG/L	R	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	2.000 <I	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.00	8000.000
		T	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	2.000 <I	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <I		
M-XYLENE	UG/L	R	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W		.000 <W	.000 <W	.000 <W	.000 <W	0.1	620.000
		T	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 SPL	.000 <W		.000 <W	.000 <W	.000 <W		
MAGNESIUM	MG/L-MG	R	8.900	7.800	7.800	9.600	7.900	7.500	10.700	9.400	10.300	10.300	9.000	16.450	0.1	NONE
		T	8.900	7.800	8.400	8.300	7.900	7.700	10.600	9.200	10.250	10.350	9.150	15.800		
MANGANESE	MG/L-MN	R	.050	.013	.010	.019	.013	.011	.044	.013	.002	.004	.005	.008	.50G/L	.050
		T	.002 <W	.001 <W	.001	.001 <	.001 <	.001	.002	.003	.005	.003	.002	.003		
MERCURY	UG/L-HG	R	.010 <	.010 <	.010	.060	.040	.050	.020	.010	.050	.010	.010 <	.010	0.010	1.000
		T	.010 <	.010 <	.030	.010	.040	.040	.010 <	.010 <	.050	.050	.050	.010		
METHOXYCHLOR	NG/L	R	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000	200000.000
		T	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W		

STONEY POINT WATER TREATMENT PLANT OWSP RESULTS

06/15/87

PARAMETERS	UNITS		SAMPLE DATE 85/06/06	85/07/02	85/08/06	85/09/05	85/10/08	85/11/04	85/12/05	85/12/17	86/01/06	86/01/15	86/01/29	86/02/26	DETECTION LIMIT	DRINKING WATER OBJ
METHYL PHENANTHRENE	UG/L	R												1.000 <W	1.000	NONE
		T												1.000 <W		
METHYLENE CHLORIDE	UG/L	R	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W		.000 <W	.000 <W	0.5	40.000
		T	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 SPL				.000 <W	.000 <W		
MIREX	NG/L	R	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000	NONE
		T	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W		
MOLYBDENUM	MG/L MB	R	.001	.002	.001 <W	.002	.001 <	.001 <W	.001	.001	.001 <	.001 <	.001 <	.001	.500/L	NONE
		T	.001 <W	.001	.001	.002	.001 <	.001 <W	.002	.001	.001 <	.001 <	.001 <	.001		
N CLOHEXYLENECYCLOHEXA	UG/L	R												1.000 <W	1.000	NONE
		T												1.000 <W		
NAPHTHALENE	UG/L	R												1.000 <W	1.000	NONE
		T												1.000 <W		
NICKEL	MG/L NI	R	.002	.002 <	.002 <	.002	.002	.002 <	.005	.003	.001	.001	.001	.002	0.002	NONE
		T	.002 <	.002 <	.002 <	.002	.002 <	.002 <	.001	.001	.002	.001	.001	.002		
NITRITE	MG/L N	R	.005	.010 <I	.010 <I	.015 <I	.005 <W	.010 <I	.030 <I	.020 <I	.008	.011	.012	.063	0.001	1.000
		T	.005	.005 <W	.005 <W	.005 <W	.005 <W	.005 <W	.010 <I	.005 <W	.000 <W	.000 <I	.004	.001 <I		
NITROGEN TOT KJELD	MG/L N	R	.500 <I	.400 <I	.300 <I	.600 <I	.300 <I	.200 <I	.750	.400 <I	.280	.270	.270	.600	0.02	NONE
		T	.200 <I	.200 <I	.100 <W	.200 <I	.100 <I	.100 <I	.500 <I	.100 <I	.160	.070	.350	.390		
O XYLENE	UG/L	R	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	0.05	620.000
		T	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 SPL			.000 <W	.000 <W	.000 <W		
OCTACHLOROSTYRENE	NG/L	R	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000	NONE
		T	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W		
OXYDI	NG/L	R	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000	60000.000
		T	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W		

STONEY POINT WATER TREATMENT PLANT OWSP RESULTS 06/15/87

PARAMETERS	UNITS		SAMPLE DATE 85/06/06	85/07/02	85/08/06	85/09/03	85/10/08	85/11/04	85/12/03	85/12/17	86/01/06	86/01/15	86/01/29	86/02/26	DETECTION LIMIT	DRINKING WATER OBJ
CHLORDANE	NG/L	R	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000	NONE
		T	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W		
P-XYLENE	UG/L	R	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W		.000 <W	.000 <W	.000 <W	.000 <W	0.1	620.000
		T	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 SPL	.000 <W		.000 <W	.000 <W	.000 <W		
P/A BOTTLE	0=ABSENT	R														.000
		T	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		
PCB	NG/L	R	20.000 <W	20.000 <W	20.000 <W	20.000 <W	20.000 <W	20.000 <W	20.000 <W	20.000 <W	20.000 <W	20.000 <W	20.000 <W	20.000 <W	20.000	6000.000
		T	20.000 <W	20.000 <W	20.000 <W	20.000 <W	20.000 <W	20.000 <W	20.000 <W	20.000 <W	20.000 <W	20.000 <W	20.000 <W	20.000 <W		
PENTACHLOROBENZENE	NG/L	R	1.000 <W	1.000 <W	1.000 <W	2.000 <I	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000	74000.000
		T	1.000 <W	1.000 <W	1.000 <W	6.000 <I	1.000 <W	3.000 <I	1.000 <W	3.000 <I	1.000 <W	6.000 <I	1.000 <W	1.000 <W		
PENTACHLOROBUTADIENE	UG/L	R												1.000 <W	1.000	NONE
		T												1.000 <W		
PENTACHLOROPHENOL	NG/L	R		50.000 <W				50.000 <W							10	10000.000
		T		50.000 <W				50.000 <W								
PENTACHLOROPROPANE	UG/L	R												1.000 <W	1.000	NONE
		T												1.000 <W		
PENTACHLOROPROPENE	UG/L	R												1.000 <W	1.000	NONE
		T												1.000 <W		
PH		R	8.120	8.210	8.290	8.180	8.210	8.090	8.180	8.230	8.080	8.090	8.160	7.690		8.500
		T	7.400	7.500	7.150	7.400	7.180	7.710	7.130	7.100	7.220	6.580	7.600	7.350		
PHOSPHORUS TTL REACT	MG/L-P	R	2.000	.010 <W	.010 <W	.010 <W	.010 <W	.010 <W	.020 <I	.010 <W	.007	.005	.005	.040	.5UG/L	NONE
		T	2.480	.010 <W	.010 <W	.010 <W	.010 <W	.010 <W	.040 <I	.010 <W	.002 <I	.001 <I	.005	.001 <I		

STONEY POINT WATER TREATMENT PLANT DWSP RESULTS

06/15/87

PARAMETERS		UNITS		SAMPLE DATE 85/06/06	85/07/02	85/08/06	85/09/03	85/10/08	85/11/04	85/12/03	85/12/17	86/01/06	86/01/15	86/01/29	86/02/26	DETECTION LIMIT	DRINKING WATER OBJ
PHOSPHORUS TOTAL	MG/L P	MG/L P	A	.060 <T	.040 <T	.020 <T	.010 <W	.010 <W	.020 <T	.160	.080 <T	.017	.025	.018	.058	0.002	NONE
			T	.100 <T	.010 <W	.010 <W	.040 <T	.010 <W	.010 <W	.010 <W	.020 <T	.005 <T	.007	.003 <T	.005 <T		
PICHLORAM	UG/L	UG/L	A		100.00 <W				100.00 <W							100.00	NONE
			T		100.00 <W				100.00 <W								
PPDDE	UG/L	UG/L	A	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000	50000.000
			T	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W		
PPDDT	UG/L	UG/L	A	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000	30000.000
			T	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W		
PROMETONE	UG/L	UG/L	A		50.000 <W				50.000 <W							50.00	NONE
			T						50.000 <W								
PROMETRYNE	UG/L	UG/L	A		50.000 <W				50.000 <W							50.00	NONE
			T						50.000 <W								
PROPAZINE	UG/L	UG/L	A		50.000 <W				50.000 <W							50.00	NONE
			T						50.000 <W								
PYRENE	UG/L	UG/L	A												1.000 <W	1.000	NONE
			T												1.000 <W		
SELENIUM	MG/L SE	MG/L SE	A	.001 <	.001 <	.001 <	.001 <	.001 <	.001 <	.001 <	.001 <	.001 <	.001 <	.001 <	.001 <	0.001	.010
			T	.001 <	.001 <	.001 <	.001 <	.001	.001 <	.001 <	.001 <	.001 <	.001 <	.001 <	.001 <		
SILICA	MG/L	MG/L	A		100.00 <W				100.00 <W							100.00	NONE
			T						100.00 <W								
SILVER	MG/L	MG/L	A		50.000 <W				50.000 <W							50.00	20000.000
			T		50.000 <W				50.000 <W								
SIMAZINE	MG/L	MG/L	A		50.000 <W				50.000 <W							50.00	NONE
			T						50.000 <W								

STONEY POINT WATER TREATMENT PLANT OWSP RESULTS 06/15/87

PARAMETERS	UNITS		SAMPLE DATE 85/06/06	85/07/02	85/08/06	85/09/03	85/10/08	85/11/04	85/12/03	85/12/17	86/01/06	86/01/15	86/01/29	86/02/26	DETECTION LIMIT	DRINKING WATER OBJ
SODIUM	MG/L-NA	R	8.300	6.200	5.800	9.600	6.000	5.000	7.000	7.800	7.500	7.000	7.500	21.300	0.2	NONE
		T	7.500	6.000	6.500	6.400	5.900	5.500	6.800	7.000	7.500	7.500	7.500	21.300		
STANDRD PLATE CNT MF	CT/ML	R	650.00	1600.0	2400.0 >	2400.0 >	350.00	940.00	2400.0 >	460.00	143.00					NONE
		T	.000	230.00	3.000		1.000	15.000	11.000	1.000	.000					
STRONTIUM	MG/L-SR	R	.130	.120	.130	.190	.180	.120	.160	.120	.130	.140	.120	.320	0.001	NONE
		T	.110	.110	.150	.120	.060	.120	.150	.110	.140	.130	.120	.310		
T COLIFORM BCKGRD MF	CT/100ML	R	35000	50000	1800.0	26000	8750	1750	6550	3700.0	510.00	560.00	2900.0	8150		NONE
		T	.000	.000	.000	5.000	.000	2.000	.000	.000	1.000	.000	.000	.000		
1-CHLOROETHYLENE	UG/L	R	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W		.000 <W	.000 <W	.000 <W	.000 <W	0.05	10.000
		T	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 SPL	.000 <W		.000 <W	.000 <W	.000 <W		
1,2DICHLOROETHYLENE	UG/L	R	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W		.000 <W	.000 <W	.000 <W	.000 <W	0.1	NONE
		T	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 SPL	.000 <W		.000 <W	.000 <W	.000 <W		
TETRACHLOROBUTANE	UG/L	R												1.000 <W	1.000	NONE
		T												1.000 <W		
TRIODAN 1	MG/L	R	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000	740000.000
		T	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W		
TRIODAN II	MG/L	R	4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000	74000.000
		T	4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000 <W		
TRIODAN SULPHATE	MG/L	R	4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000	NONE
		T	4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000 <W		
TOLUENE	UG/L	R	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W		.000 <W	.000 <W	.000 <W	.000 <W	0.05	14300.000
		T	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 SPL	.000 <W		.000 <W	.000 <W	.000 <W		

STONEY POINT WATER TREATMENT PLANT DWSP RESULTS 06/15/87

PARAMETERS		UNITS		SAMPLE DATE 85/06/06	85/07/02	85/08/06	85/09/03	85/10/08	85/11/04	85/12/03	85/12/17	86/01/06	86/01/15	86/01/29	86/02/26	DETECTION LIMIT	DRINKING WATER OBJ
TOTAL COLIFORM MF	CT/100ML		R			2.000 ASC	1000.0		400.00	1000.0	900.00	4.000 ASC	4.000 ASC	106.00 ASC	500.00		NONE
			T	.000	.000	.000	1.000	.000	.000	.000	.000	.000	.000	.000	.000		
TOTAL NITRATES	MG/L N		R					.500	.200 <T	2.700	1.350	1.410	1.540	1.100	4.390	0.02	10.000
			T					.400		2.650	1.350	1.370	1.550	1.100	4.350		
TOTAL SOLIDS	MG/L		R	230.00	164.00	158.00 CRO	219.00	165.00	149.00 CRO	313.00	202.00	209.00 CRO	211.00 CRO	190.00 CRO	402.00	2.0	500.000
			T	191.00 CRO	160.00	173.00 CRO	171.00 CRO	168.00 CRO	190.00 CRO	250.00 CRO	210.00 CRO	214.00 CRO	225.00 CRO	195.00 CRO	403.00		
TOTL TRIHALOMETHANES	UG/L		R	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W		.000 <W	.000 <W	.000 <W	.000 <W	0.2	350.000
			T	51.000	57.000	100.00	86.000	66.000	72.000	74.000 SPL	61.000		33.000	69.000	73.000		
TRICHLOROETHYLENE	UG/L		R	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W		.000 <W	.000 <W	.000 <W	.000 <W	0.1	30.000
			T	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 SPL	.000 <W		.000 <W	.000 <W	.000 <W		
TRICHLOROFLUOROMETHANE	UG/L		R	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W		.000 <W	.000 <W	.000 <W	.000 <W	0.1	NONE
			T	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 SPL	.000 <W		.000 <W	.000 <W	.000 <W		
TURBIDITY	FTU		R	34.000	16.400	9.300	16.300	15.400	12.000	96.000	38.000	6.200	5.500	6.400	4.700	0.02	1.000
			T	.360 <T	.250 <T	.810 <T	.340 <T	.470 <T	.420 <T	1.360	.590 <T	.240 <T	.140 <T	.340 <T	.370 <T		
URANIUM	MG/L U		R	.002 <	.002 <	.002 <	.002 <	.002 <	.002 <	.002 <	.002 <	.002 <	.002 <	.002 <	.002 <	0.1 UG/L	.020
			T	.002 <	.002 <	.002 <	.002 <	.002 <	.002 <	.002 <	.002 <	.002 <	.002 <	.002 <	.002 <		
VANADIUM	MG/L V		R	.004	.001	.001	.001	.001	.001	.005	.002	.001 <	.001 <	.001 <	.003	.5UG/L	NONE
			T	.001 <W	.001 <W	001 <W	.001 <	.001 <	.001 <W	.001	.001 <	.001 <	.001 <	.001 <	.003		
ZINC	MG/L ZN		R	.018	.009	.004	.006	.008	.009	.015	.009	.004	.006	.008	.008	.5UG/L	5.000
			T	.002	.003	.004	.005	.002	.005	.003	.003	.005	.010	.005	.005		

SIONET POINT WATER TREATMENT PLANT OWSP RESULTS 06/15/87

PARAMETERS	UNITS		SAMPLE DATE 86/03/18	86/04/07	86/04/21	86/05/13	86/06/18	86/12/15						DETECTION LIMIT	DRINKING WATER OBJ
1,1 DICHLOROETHANE	UG/L	R	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W						0.10	10.000
		T	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W							
1,1 DICHLOROETHYLENE	UG/L	R	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W						0.10	.300
		T	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W							
1,2 DICHLOROBENZENE	UG/L	R	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W						0.05	400.000
		T	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W							
1,2 DICHLOROETHANE	UG/L	R	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W						0.05	NONE
		T	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W							
1,2 DICHLOROPROPANE	UG/L	R	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W						0.05	6.000
		T	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W							
1,3 DICHLOROBENZENE	UG/L	R	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W						0.10	400.000
		T	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W							
1,4 DICHLOROBENZENE	UG/L	R	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W						0.01	400.000
		T	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W							
111, TRICHLOROETHANE	UG/L	R	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W						0.02	NONE
		T	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W							
112 TRICHLOROETHANE	UG/L	R	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W						0.05	6.000
		T	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W							
1122 1-CHLOROETHANE	UG/L	R	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W						0.05	1.700
		T	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W							
123 TRICHLOROBENZENE	NG/L	R	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W						5.000	10000.000
		T	5.000 <W		5.000 <W	5.000 <W	5.000 <W	5.000 <W							
1234 1-CHLOROBENZENE	NG/L	R	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W						1.000	38000.000
		T	1.000 <W		1.000 <W	1.000 <W	1.000 <W	1.000 <W							

STONEY POINT WATER TREATMENT PLANT DWSP RESULTS 06/15/87

PARAMETERS	UNITS		SAMPLE DATE 86/03/18	86/04/07	86/04/21	86/05/13	86/06/18	86/12/15	DETECTION LIMIT	DRINKING WATER OBJ
1235 T-CHLOROBENZENE	UG/L	R	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000	15000.000
		T			1.000 <W	1.000 <W	31.000	1.000 <W		
124 TRICHLOROBENZENE	UG/L	R	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000	NONE
		T	5.000 <W		5.000 <W	5.000 <W	5.000 <W	5.000 <W		
1245 T-CHLOROBENZENE	UG/L	R	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000	38000.000
		T	1.000 <W		1.000 <W	1.000 <W	1.000 <W	1.000 <W		
135 TRICHLOROBENZENE	UG/L	R	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000	10000.000
		T	5.000 <W		5.000 <W	5.000 <W	5.000 <W	5.000 <W		
236 TRICHLOROTOLUENE	UG/L	R	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000	NONE
		T			5.000 <W	5.000 <W	26.000	5.000 <W		
245 TRICHLOROTOLUENE	UG/L	R	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000	10000.000
		T	5.000 <W		5.000 <W	1.000 <W	5.000 <W	5.000 <W		
26A TRICHLOROTOLUENE	UG/L	R	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000	NONE
		T	5.000 <W		5.000 <W	5.000 <W	4.000 <W	5.000 <W		
AEROMONAS SP	0=ABSENT	R								.000
		T						.000		
ALACHLOR	UG/L	R						500.00 <W	500	NONE
		T						500.00 <W		
ALDRIN	UG/L	R	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000	1400.000
		T	1.000 <W		1.000 <W	1.000 <W	1.000 <W	1.000 <W		
ALKALINITY	MG/L-CAC	R	181.30	98.700	99.40	115.50	92.200	105.10	0.2	NONE
		T	162.10	79.200	68.200	72.600	71.000	78.100		

STONEY POINT WATER TREATMENT PLANT DWSP RESULTS 06/15/87

PARAMETERS	UNITS		SAMPLE DATE 86/03/18	86/04/07	86/04/21	86/05/13	86/06/18	86/12/15							DETECTION LIMIT	DRINKING WATER OBJ
ALPHA BHC	NG/L	R	1.000 <W	3.000 <I	1.000 <W	4.000 <I	2.000 <I	2.000 <I							1.000	700.000
		T			1.000 <W	3.000 <I	4.000 <I	2.000 <I								
ALPHA CHLORDANE	NG/L	R	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W							2.000	1400.000
		T	2.000 <W		2.000 <W	2.000 <W	2.000 <W	2.000 <W								
ALUMINUM	MG/L-AL	R	.330	.380	.590	.530		.880							0.01	.100
		T	.220	.047	.034	.520	.051	.069								
AMETRINE	NG/L	R				50.000 <W		50.000 <W							50.00	NONE
		T				50.000 <W		50.000 <W								
AMMONIUM TOTAL	MG/L-N	R	.096	.012	.024	.020	.024	.024							0.002	NONE
		T	.008	.004 <I	.008	.020	.020	.002 <I								
ARSENIC	MG/L-AS	R	.001 <	.001 <	.001 <	.001 <		.001 <							0.001	.050
		T	.001 <	.001 <	.001 <	.001 <	.001 <	.001 <								
ATRATONE	NG/L	R				50.000 <W		130.00 <I							50.00	NONE
		T				50.000 <W		50.000 <W								
ATRATINE	NG/L	R				90.000 <I		130.00 <I							50.00	46000.000
		T				50.000 <W		140.00 <I								
BARIUM	MG/L-BA	R	.023	.014	.018	.019		.019							0.001	1.000
		T	.018	.013	.014	.015	.017	.014								
BENZENE	UG/L	R	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W							0.05	10.000
		T	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W								
BERYLLIUM	MG/L-BE	R	.001 <	.001 <	.001 <	.001 <		.001 <							0.005	NONE
		T	.001 <	.001 <	.001 <	.001 <	.001 <	.001 <								
BETA BHC	NG/L	R	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W							1.000	700.000
		T	1.000 <W		1.000 <W	1.000 <W	1.000 <W	1.000 <W								

STONEY POINT WATER TREATMENT PLANT OWSP RESULTS

06/15/87

PARAMETERS	UNITS		SAMPLE DATE 86/03/18	86/04/07	86/04/21	86/05/13	86/06/10	86/12/15							DETECTION LIMIT	DRINKING WATER OBJ
BLADEX	MG/L	A T				100.00 <W 100.00 <W		290.00 <I 100.00 <W							100.00	NONE
BORON	MG/L BO	A T	.020 < .040	.080 < .080 <	.080 < .080 <	.040 .030	.020	.030 .020							0.005	5.000
BROMOFORM	UG/L	A T	.000 <W .000 <W	.000 <W .000 <W	.000 <W .000 <W	.000 <W .000 <W	.000 <W .000 <W	.000 <W .000 <W							0.2	700.000
CADMIUM	UG/L CD	A T	.200 < .200 <	.200 < .200 <	.200 < .300 <	.300 < .300 <	.300 <	.300 < .300 <							2.000	5.000
CALCIUM	MG/L CA	A S	75.000 76.000	35.300 38.700	34.400 34.100	40 000 33.900	31.600 31.700	37.700 37.000							0.2	NONE
CARBON TETRACHLORIDE	UG/L	A T	.000 <W .000 <W	.000 <W .000 <W	.000 <W .000 <W	.000 <W .000 <W	.000 <W .000 <W	.000 <W .000 <W							0.2	5.000
CHLORIDE	MG/L CL	A T	49 800 52.500	12.600 14.450	11.600 12.300	14.550 13.500	9.500 11.000								0.5	250.000
CHLORIDE	MG/L CL-	A T						12.500 15.000							0.5	250.000
CHLOROBENZENE	UG/L	A T	.000 <W .000 <W	.000 <W .000 <W	.000 <W .000 <W	.000 <W .000 <W	.000 <W .000 <W	.000 <W .000 <W							0.1	100.000
CHLORODIBROMOMETHANE	UG/L	A T	000 <W 6 000	.000 <W 6.000	.000 <W 7.000	.000 <W 5.000	000 <W 7.000	.000 <W 5.000							0.1	333.000
CHLOROFORM	UG/L	A T	.000 <W 54 000	000 <W 24.000	.000 <W 12.000	.000 <W 48.000	.000 <W 30.000	.000 <W 24.000							0.1	350.000

STONEY POINT WATER TREATMENT PLANT OWSP RESULTS 06/15/87

PARAMETERS		UNITS	SAMPLE DATE 86/03/18	86/04/07	86/04/21	86/05/13	86/06/18	86/12/15	DETECTION LIMIT	DRINKING WATER OBJ
CHROMIUM	MG/L CR	R	.003	.002	.001 <	.001		.001	.5UG/L	50.000
		T	.003	.002	.001 <	.001 <	.001 <	.001 <		
CL4 BIPENYL	UG/L	R	1.000 <W	1.000 <W	1.000 <W				1.000	NONE
		T	1.000 <W	1.000 <W	1.000 <W					
COBALT	MG/L-CO	R	.001	.001 <	.001 <	.001 <		.001 <	.5UG/L	NONE
		T	.001 <	.001 <	.001 <	.001 <	.001 <	.001 <		
COLIFORM	O-ARRENT	R								.000
		T						.000		
COLOUR	HZU	R	14.500	13.000	6.500	5.000	7.500	11.000	0.5	5.000
		T	5.000	.500 <W	.500 <I	.500 <I	.500 <I	1.000 <I		
CONDUCTIVITY	UMHO/CM	R	586.00	277.00	265.00	315.00	249.00	288.00	1.0	NONE
		T	598.00	309.00	272.00	280.00	259.00	301.00		
COPPER	MG/L-CU	R	.025	.015	.015	.014		.002	.5UG/L	1.000
		T	.008	.006	.001	.004	.003	.002		
CYANIDE	MG/L-CN	R	.001 <W	.001 <W	.001 <W	.001 <W	.001 <W	.001 <W	0.001	.400
		T	.001 <W	.001 <W	.001 <W	.001 <W	.001 <W	.001 <W		
DOD	MG/L	R	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000	NONE
		T	5.000 <W		5.000 <W	5.000 <W	5.000 <W	5.000 <W		
DI-N BUTYL PHTHALATE	UG/L	R	1.000 <W	1.000 <W	1.000 <W				1.000	NONE
		T	1.000 <W	1.000 <W	1.000 <W					
DICHLOROBROMOMETHANE	UG/L	R	000 <W	.000 <W	000 <W	.000 <W	000 <W	000 <W	0.05	700.000
		T	15.000	10.000	7.000	10.000	16.000	12.000		
DIELDRIN	NG/L	R	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000	1400.000
		T	2.000 <W		2.000 <W	2.000 <W	2.000 <W	2.000 <W		

STONEY POINT WATER TREATMENT PLANT OUSP RESULTS 06/15/87

PARAMETERS	UNITS		SAMPLE DATE 86/03/18	86/04/07	86/04/21	86/05/13	86/06/18	86/12/15	DETECTION LIMIT	DRINKING WATER OBJ
DIPHENYL ETHER	UG/L	R	1.000 <W	1.000 <W	1.000 <W				1.000	NONE
		T	1.000 <W	1.000 <W	1.000 <W					
E. COLI P/A	0=ABSENT	R						.000		NONE
		T								
ENDRIN	NG/L	R	4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000	400.000
		T	4.000 <W		4.000 <W	4.000 <W	4.000 <W	4.000 <W		
ETHYLENE DIBROMIDE	UG/L	R			.000 <W	.000 <W	.000 <W	.000 <W	0.05	NONE
		T			.000 <W	.000 <W	.000 <W	.000 <W		
ETHYLBENZENE	UG/L	R	000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	0.05	1400.000
		T	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W		
FECAL COLIFORM	0=ABSENT	R						.000		.000
		T								
FECAL COLIFORM MF	CT/100ML	R	.000	.000	.000	.000	.000	14.000 A3C		.000
		T								
FLD CHLORINE (COMB)	MG/L-CL	R	.200	1.200	1.450	.300	.200	1.620		NONE
		T								
FLD CHLORINE (TOTAL)	MG/L CL	R	900	2.300	1.500	1.500	1.000	1.720		NONE
		T								
FLD CHLORINE FREE	MG/L CL	R	.700	1.500	1.100	1.200	.800	1.500		NONE
		T								
FLD PH		R	7.800	7.800	7.800	7.800	7.600	7.600		NONE
		T	7.200	7.400	7.400	7.400	7.300	7.600		

STONEY POINT WATER TREATMENT PLANT DWSP RESULTS 06/15/87

PARAMETERS	UNITS		SAMPLE DATE 86/03/18	86/04/07	86/04/21	86/05/13	86/06/10	86/12/15	DETECTION LIMIT	DRINKING WATER OBJ
FLD TEMPERATURE	DEG.C	R	3.000	8.500	9.000	15.000	19.000	2.000		NONE
		T	5.000	10.000	8.200	15.100	19.000	2.000		
FLD TURBIDITY	FTU	R				10.600	20.000	30.000		NONE
		T			.300	.260	.150	.350		
FLUORANTHENE	UG/L	R	1.000 <W	1.000 <W	1.000 <W				1.000	NONE
		T	1.000 <W	1.000 <W	1.000 <W					
FLUORIDE	MG/L-F	R	.180	.110	.100	.130	.120	.120	0.01	2.400
		T	.150	.060	.040	.150	.060	.060		
GAMMA CHLORDANE	NG/L	R	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000	7700.000
		T	2.000 <W		2.000 <W	2.000 <W	2.000 <W	2.000 <W		
HARDNESS	MG/L-CAC	R	247.40	122.50	120.00	139.50	111.50	131.50		500.000
		T	250.70	133.00	119.00	118.50	111.50	128.00		
HCB	NG/L	R	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000	NONE
		T	1.000 <W		1.000 <W	1.000 <W	1.000 <W	1.000 <W		
HEPTACHLOR	NG/L	R	1.000 <W	1.000 <W	1.000 <W	1.000 <W	4.000 <I	1.000 <W	1.000	3000.000
		T	1.000 <W		1.000 <W	1.000 <W	1.000 <W	1.000 <W		
HEPTACHLOR EPOXIDE	NG/L	R	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000	6000.000
		T	1.000 <W		1.000 <W	1.000 <W	1.000 <W	1.000 <W		
HEXACHLOROBUTADIENE	NG/L	R	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000	4500.000
		T			1.000 <W	1.000 <W	1.000 <W	1.000 <W		
HEXACHLOROETHANE	NG/L	R	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000	19000.000
		T	1.000 <W		1.000 <W	12.000	1.000 <W	1.000 <W		
HEXACHLOROPROPENE	UG/L	R	1.000 <W	1.000 <W	1.000 <W				1.000	NONE
		T	1.000 <W	1.000 <W	1.000 <W					

STONEY POINT WATER TREATMENT PLANT DWSP RESULTS

06/15/87

PARAMETERS		UNITS		SAMPLE DATE 86/03/10	86/04/07	86/04/21	86/05/13	86/06/10	86/12/15							DETECTION LIMIT	DRINKING WATER OBJ
IRON	MG/L FE		R	.280	.360	.630	.320	.003	.010							0.02	.300
			T	.017	.004	.001 <	.039		.010								
LEAD	MG/L PB		R	.003 <	.003 <	.003 <	.003 <	.003 <	.003 <							0.005	.050
			T	.003 <	.003 <	.003 <	.003 <		.003 <								
LINDANE	NG/L		R	1.000 <W	1.000 <W	1.000 <W	2.000 <I	1.000 <W	1.000 <W							1.00	8000.000
			T			1.000 <W	1.000 <I	2.000 <I	1.000 <W								
M-XYLENE	UG/L		R	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W							0.1	620.000
			T	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W								
MAGNESIUM	MG/L MG		R	14.600	8.300	8.350	9.550	7.900	9.100							0.1	NONE
			T	14.800	8.830	8.250	8.250	7.800	8.750								
MANGANESE	MG/L MN		R	.013	.006	.014	.010		.011							.50UG/L	.050
			T	.003	.002	.001	.001	.001 <W	.001								
MERCURY	UG/L HG		R	.010 <	.010 <		.010 <	.010 <	.030							0.010	1.000
			T	.030	.060		.010 <	.010 <	.040								
METHOXYCHLOR	NG/L		R	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W							5.000	200000.000
			T	5.000 <W		5.000 <W	5.000 <W	5.000 <W	5.000 <W								
METHYL PHENANTHRENE	UG/L		R	1.000 <W	1.000 <W	1.000 <W										1.000	NONE
			T	1.000 <W	1.000 <W	1.000 <W											
METHYLENE CHLORIDE	UG/L		R			.000 <W	.000 <W	.000 <W	.000 <W							0.5	40.000
			T				.000 <W		.000 <W								
METOLACHLOR	NG/L		R						500.00 <W							500	NONE
			T						500.00 <W								

SIDNEY POINT WATER TREATMENT PLANT DWSP RESULTS 06/15/07

PARAMETERS	UNITS		SAMPLE DATE 86/03/18	86/04/07	86/04/21	86/05/13	86/06/18	86/12/15	DETECTION LIMIT	DRINKING WATER OBJ
MIREX	NG/L	R	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000	NONE
		1	5.000 <W		5.000 <W	5.000 <W	5.000 <W	5.000 <W		
MIXTBDENUM	MG/L MB	R	.001 <	.001 <	.001 <	.001 <W		.001 <W	.500/L	NONE
		1	.001 <	.001 <	.001 <W	.001 <W	.001 <W	.001 <W		
M CL2METHYLENECESANA	UG/L	R	1.000 <W	1.000 <W	1.000 <W				1.000	NONE
		1	1.000 <W	1.000 <W	1.000 <W					
NAPHTHALENE	UG/L	R	1.000 <W	1.000 <W	1.000 <W				1.000	NONE
		1	1.000 <W	1.000 <W	1.000 <W					
NICKEL	MG/L NI	R	.003	.001	.002	.002 <		002 <	0.002	NONE
		1	.002	.001	.002 <	.002 <	.002 <	.002 <		
NITRITE	MG/L-N	R	.060	.021	.011	045	.010	.017	0.001	1.000
		1	.001 <1	.005	.000 <W	.003	.000 <1	.001 <W		
NITROGEN TOT KJELD	MG/L N	R	.670	.370	.500	.330	.260	.175 <1	0.02	NONE
		1	.590	.130	.060 <1	.090	.070	.070 <1		
O XYLENE	UG/L	R	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	0.05	620.000
		1	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W		
OCTACHLOROSTYRENE	NG/L	R	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000 <W	1.000	NONE
		1	1.000 <W		1.000 <W	1.000 <W	1.000 <W	1.000 <W		
OPDDT	NG/L	R	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000 <W	5.000	60000.000
		1	5.000 <W		5.000 <W	5.000 <W	5.000 <W	5.000 <W		
ORTHOCHROME	NG/L	R	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000	NONE
		1	2.000 <W		2.000 <W	2.000 <W	2.000 <W	2.000 <W		
P XYLENE	UG/L	R	000 <W	.000 <W	.000 <W	.000 <W	000 <W	.000 <W	0.1	620.000
		1	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W		

STONEY POINT WATER TREATMENT PLANT OWSP RESULTS 06/15/07

PARAMETERS	UNITS		SAMPLE DATE 86/03/10	86/04/07	86/04/21	86/05/13	86/06/10	86/12/15	DETECTION LIMIT	DRINKING WATER OBJ
P/A BOTTLE	0=ABSENT	R T	.000	.000	.000	.000	.000	1.000 72P		.000
PCB	UG/L	R T	20.000 <W 20.000 <W	20.000 <W	20.000 <W 20.000 <W	20.000 <W 20.000 <W	20.000 <W 20.000 <W	20.000 <W 20.000 <W	20.000	6000.000
PENTACHLOROBENZENE	UG/L	R T	1.000 <W 1.000 <W	1.000 <W	1.000 <W 1.000 <W	1.000 <W 1.000 <W	1.000 <W 1.000 <W	1.000 <W 1.000 <W	1.000	74000.000
PENTACHLOROBUTADIENE	UG/L	R T	1.000 <W 1.000 <W	1.000 <W 1.000 <W	1.000 <W 1.000 <W				1.000	NONE
PENTACHLOROPROPANE	UG/L	R T	1.000 <W 1.000 <W	1.000 <W 1.000 <W	1.000 <W 1.000 <W				1.000	NONE
PENTACHLOROPROPENE	UG/L	R T	1.000 <W 1.000 <W	1.000 <W 1.000 <W	1.000 <W 1.000 <W				1.000	NONE
PH		R T	8.050 7.770	8.260 7.370	8.200 7.620	8.280 7.380	8.270 7.660	8.330 8.020		8.500
PHOSPHORUS PTL REACT	MG/L P	R T	.042 .002 <I	.015 .001 <I	.008 .000 <I	.006 .001 <I	.011 .001 <I	.006 .001 <I	.500/L	NONE
PHOSPHORUS TOTAL	MG/L P	R T	.083 .013	.051 .004 <I	.110 .001 <W	.030 .001 <W	.036 .001 <W	.045 .007 <I	0.002	NONE
PPDDE	UG/L	R T	1.000 <W 1.000 <W	1.000 <W	1.000 <W 1.000 <W	1.000 <W 1.000 <W	1.000 <W 1.000 <W	1.000 <W 1.000 <W	1.000	30000.000
PPDDT	UG/L	R T	5.000 <W 5.000 <W	5.000 <W	5.000 <W 5.000 <W	5.000 <W 5.000 <W	5.000 <W 5.000 <W	5.000 <W 5.000 <W	5.000	30000.000

STONEY POINT WATER TREATMENT PLANT DWSP RESULTS 06/15/87

PARAMETERS		UNITS	SAMPLE DATE 86/03/18	86/04/07	86/04/21	86/05/13	86/06/18	86/12/15							DETECTION LIMIT	DRINKING WATER OBJ
PROMETONE	NG/L	R				50.000 <W		70.000 <I							50.00	NONE
		T				50.000 <W		50.000 <W								
PROMETRYNE	NG/L	R				50.000 <W		50.000 <W							50.00	NONE
		T				50.000 <W		50.000 <W								
PROPAZINE	NG/L	R				50.000 <W		50.000 <W							50.00	NONE
		T				50.000 <W		50.000 <W								
PYRENE	UG/L	R	1.000 <W	1.000 <W	1.000 <W										1.000	NONE
		T	1.000 <W	1.000 <W	1.000 <W											
SELENIUM	MG/L-SE	R	.001 <	.001 <	.001 <	.001 <		.001 <							0.001	.010
		T	.001 <	.001 <	.001 <	.001 <	.001 <	.001 <								
SENCOR	NG/L	R				100.00 <W		100.00 <W							100.00	NONE
		T				100.00 <W		100.00 <W								
SIMAZINE	NG/L	R				50.000 <W		50.000 <W							50.00	NONE
		T				50.000 <W		50.000 <W								
SODIUM	MG/L-NA	R	25.500	6.600	7.200	9.000	6.000	7.200							0.2	NONE
		T	25.500	6.900	6.700	7.200	6.000	7.000								
STANDRD PLATE CNT MF	CT/ML	R		370.00		2400.0 >		2400.0 >								NONE
		T		5.000	1.000			.000								
STAPH AUREUS	0=ABSENT	R						.000								.000
		T														
STRONTIUM	MG/L-SR	R	.100	.120	.120	.150		.130							0.001	NONE
		T	.290	.130	.100	.120	.120	.130								
T COLIFORM BCRGRD MF	CT/100ML	R	<1000	1120.0	13000	280.00	38000	6000.0								NONE
		T	000	.000	.000	.000	.000	1.000								

STONEY POINT WATER TREATMENT PLANT DWSP RESULTS 06/15/87

PARAMETERS	UNITS		SAMPLE DATE 86/03/18	86/04/07	86/04/21	86/05/13	86/06/18	86/12/15	DETECTION LIMIT	DRINKING WATER OBJ
1-CHLOROETHYLENE	UG/L	R	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	0.05	10.000
		T	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W		
1,2-DICHLOROETHYLENE	UG/L	R	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	0.1	NONE
		T	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W		
TETRACHLOROBUTANE	UG/L	R	1.000 <W	1.000 <W	1.000 <W				1.000	NONE
		T	1.000 <W	1.000 <W	1.000 <W					
THIODAN I	NG/L	R	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000 <W	2.000	740000.000
		T	2.000 <W		2.000 <W	2.000 <W	2.000 <W	2.000 <W		
THIODAN II	NG/L	R	4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000	74000.000
		T	4.000 <W		4.000 <W	4.000 <W	4.000 <W	4.000 <W		
THIODAN SULPHATE	NG/L	R	4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000 <W	4.000	NONE
		T	4.000 <W		4.000 <W	4.000 <W	4.000 <W	4.000 <W		
TIN	MG/L SN	R						.000 NP		NONE
		T						.000 NP		
TOLUENE	UG/L	R	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	0.05	14300.000
		T	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W		
TOTAL COLIFORM MF	CT/100ML	R	142.00 A3C	20.000 A3C	15.000 A3C	1.000	6.000 A3C	142.00 A3C		NONE
		T	.000	.000	.000	.000	.000	.000		
TOTAL NITRATES	MG/L N	R	4.310	1.190	.705	1.100	.655	1.120	0.02	10.000
		T	4.410	1.400	.575	.610	.575	1.100		
TOTAL SOLIDS	MG/L	R	385.00	183.00	264.00	205.00 CRO	182.00	194.00	2.0	500.000
		T	389.00	201.00 CRO	177.00 CRO	182.00 CRO	168.00 CRO	179.00		

STONEY POINT WATER TREATMENT PLANT DWSP RESULTS 06/15/87

PARAMETERS	UNITS		SAMPLE DATE 86/03/18	86/04/07	86/04/21	86/05/13	86/06/18	86/12/15	DETECTION LIMIT	DRINKING WATER OBJ
TOTL TRIHALOMETHANES	UG/L	R	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	0.2	350.000
		T	75.000	40.000	26.000	71.000	61.000	39.000		
TOXAPHENE	MG/L	R						.000 HP		NONE
		T						.000 HP		
TRICHLOROETHYLENE	UG/L	R	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	0.1	30.000
		T	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W		
TRIFLUOROCHLORDTOLUE	UG/L	R	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	0.1	NONE
		T	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W	.000 <W		
TURBIDITY	FTU	R	11.400	16.100	64.000	12.600	19.800	26.000	0.02	1.000
		T	.640 <I	.400 <I	.280 <I	.310 <I	.210 <I	.300		
URANIUM	MG/L-U	R	.002 <	.002 <	.002 <	.002 <			0.1 UG/L	.020
		T	.002 <	.002 <	.002 <	.002 <	.002 <			
URANIUM	UG/L-U	R						.620	0.1	NO O
		T						.200 <		
VANADIUM	MG/L-V	R	.001	.001 <	.001	.001		.002	.5UG/L	NONE
		T	.001 <	.001 <	.001 <W	.001 <W	.001 <W	.001 <W		
ZINC	MG/L-ZN	R	.009	.006	.009	.006		.005	.5UG/L	5.000
		T	.005	.007	.005	.031	.005	.004		

APPENDIX D
TERMS OF REFERENCE

Purpose

To review the present conditions and determine an optimum treatment strategy for contaminant removal at the plant, with emphasis on particulate materials and disinfection processes.

Work Tasks

1. Receive an information package from the MOE. Review the information provided and meet with the MOE staff, if required, to discuss the project.

2. Document the quality and quantity of raw and treated waters.

3. Define the present treatment processes and operating procedures. Prepare a progress report on Works Tasks 1-3 for the Project Committee.

4. Assess the methods of efficient particulate removal which would utilize the present major capital works of the plant. Evaluate the particulate removal efficiency and sensitivity of operation, assuming optimum performance of the plant.

5. Assess current disinfection practices and possible improvement methods.

6. Describe possible short and long-term process modifications to obtain optimum disinfection and contaminant removal.

7. Prepare a draft report for the project committee's review.

8. Prepare the final report.

1. RECEIVE AN INFORMATION PACKAGE FROM THE MOE. REVIEW THE INFORMATION PROVIDED AND MEET WITH THE MOE STAFF, IF REQUIRED, TO DISCUSS THE PROJECT.

Elements of Work

(a) Receive an information package from the MOE concerning the plant and the study. This package includes a general terms of reference, a general table of contents for organizing the study in a manner consistent with other plant reports, the WPOS reporting tables and a copy of Ontario Drinking Water Objectives.

(b) Review the information and prepare for a meeting to initiate the work on the project, including preparation of a schedule of manpower and staff committments.

(c) Meet with the MOE to discuss the available data, the terms of reference, and the project staff and work schedule. If a consultant is carrying out more that one study it may not be necessary to meet with the MOE at the start of each study.

2. DOCUMENT THE QUALITY AND QUANTITY OF RAW AND TREATED WATERS.

Elements of Work

(a) Prepare a monthly summary of maximum, minimum, and average flows for the last three consecutive years (Table 1.0). Address any discrepancies which exist between raw and treated flow rates.

(b) Based on the above, briefly review and tabulate for the last three years, the monthly maximum, minimum, and average per capita flow for the total population served by the plant (Table 1.1). Compare the plant data with typical per capita flows for the local region. Indicate major consumers who may influence the figures.

(c) Document the methods of measuring the raw and treated water flow rates.

(d) Summarize, for the last three consecutive years, where available, the raw and treated water; turbidity, colour, residual aluminum/iron, pH, temperature and treatment chemical dosages (other than disinfection and fluoridation). The summary should indicate the monthly daily average and maximum and minimum day (Table 2.0).

For the same three year period, tabulate also the daily average for the typical seasonal months of January, April, July and October as well as other months in which problems with particulate removal occurred (Tables 2). Document enough data to define and evaluate those problems.

Record other data, such as particulate counting, suspended solids, and algae counting (Table 5.0) which could reflect on particulate removal efficiency.

Document the source and methods used in determining all information.

A comparison should be made between the plant and outside laboratory information to ascertain the relative validity of the data. For plant data, emphasis should be given to plant laboratory tests rather than continuous process control instruments.

(e) Summarize for the last three consecutive years, where available, the disinfectant demand, dosages (including all disinfection related chemicals and residuals) for all application points as well as fluoridation dosage and residual. The summary should indicate the monthly daily average and maximum and minimum day (Table 3.0).

For the same three year period, tabulate (Tables 3) the daily average for the typical seasonal months of January, April, July and October as well as other months in which problems with chlorine residuals and/or positive bacterial tests identified in Table 6. Document enough data to define and evaluate those problems.

Document the methods of dosage evaluation and residual measurements, and establish the validity of the data provided.

(f) Prepare a summary, based on at least three years of data, of the raw and treated water quality testing data for physical, microbiological, radiological, and chemical water quality information (Table 4). Document as much data as is needed to show possible seasonal trends in water quality. Where possible, show corresponding sets of raw and treated water quality information.

Document the source and methods used in determining all water quality information and establish the validity of the data, comparing plant and outside laboratory data.

(g) Tabulate, for the last three consecutive years, the raw and treated water bacterial test information at the plant (Table 6).

Document the source and methods used for all data provided.

(h) Document the water sampling systems (source, pump, line-material and size, vertical rise velocity sampling location) used in the plant (similar to DWSP Questionnaire in Appendix A).

(i) Prepare a summary of inplant testing including Test, Sampling Point, Testing Frequency, Reporting Frequency, Testing Instrumentation including calibration.

(j) Identify other water quality concerns, not related to particulate removal or disinfection, which should be considered as part of the assessment phase of this evaluation program.

3. DEFINE THE PRESENT TREATMENT PROCESSES AND OPERATING PROCEDURES. PREPARE A PROGRESS REPORT ON WORK TASKS 1-3 (8 COPIES), FOR THE PROJECT COMMITTEE.

Elements of Work

(a) Where drawings are available, assemble sufficient record drawings of a reduced size, to document the general site layout and the interrelationship of major plant components. If available, include a process and piping diagram (PAPD) of the plant operations.

(b) Prepare a simplified block schematic of all major plant components including chemical systems and indicating design parameters. Appendix B is an example of the required standard schematic.

(c) Prepare a photographic record of the plant facilities, illustrating all of the major plant components and chemical feed systems. The record should include approximately 30-40 coloured (9 cm x 12 cm) (or 10 cm x 15 cm) prints, suitably labelled. The progress and draft reports may include photocopies in lieu of the prints.

(d) Tabulate the design parameters for all the major plant components, with emphasis on the process operations, including chemical feeds. This information, as a minimum, must be consistent with the OWSP Questionnaire (Appendix A) and must be confirmed and verified by field observations. The design parameters should be evaluated at design, rated and actual operational flows.

(e) Prepare a summary of how the plant is operated, including chemical dosage control, such as jar testing information, filter backwashing procedures and initiation, and pumping and flow control.

(f) Document all reported and other apparent problems in plant operations and/or in the distribution system related to water quality. In addition list the health related parameters which exceed the Ontario Drinking Water Objectives (Table 7).

(g) Submit 8 copies of the progress report to the Prime Consultant for distribution to the Project Committee.

4. ASSESS THE METHODS OF EFFICIENT PARTICULATE REMOVAL WHICH WOULD UTILIZE THE PRESENT MAJOR CAPITAL WORKS OF THE PLANT. EVALUATE THE PARTICULATE REMOVAL EFFICIENCY AND SENSITIVITY OF OPERATION, ASSUMING OPTIMUM PERFORMANCE OF THE PLANT.

Elements of Work

(a) Assess the validity and implication of all information relating to particulate removal provided in Work Tasks 1 and 2 with emphasis on method, metering and sampling, etc.

(b) Using information provided in Work Tasks 1, 2 and 3 evaluate the plant's particulate removal efficiency. The basis of minimum particulate removal should be 1.0 F.t.u. It should, however, be recognized that it is desirable to strive for an operational level which is as low as is achievable.

(c) Conduct an evaluation of possible optimum performance alternatives. Include jar testing using established industry practice.

(d) Evaluate the feasibility of optimum removal using the existing plant capital works. This evaluation should consider the worst case water quality conditions, even though field testing data may not be available during the initial phase of the study (see Work Task 7).

(e) Describe the operational procedures, management strategies, and equipment required for various feasible alternatives. Estimate chemical dosages, level of operational expertise, and sensitivity of operation of the alternatives.

5. ASSESS CURRENT DISINFECTION PRACTICES AND POSSIBLE IMPROVEMENT METHODS.

Elements of Work

(a) Assess the validity and implication of all information relating to disinfection provided in Work Tasks 1, 2 and 3 with emphasis on method, metering and sampling etc.

(b) Using the information provided in Work Tasks 1, 2 and 3 evaluate the plant's ability to disinfect the water. The basis of minimum disinfection should be to ensure a water quality as described in the Ontario Drinking Water Objectives.

(c) Conduct an evaluation of possible optimum disinfection procedures for the plant, with consideration also given to the reduction of chlorinated by-products in the treated water.

(d) Evaluate the feasibility of the various alternatives using the existing plant capital works.

(e) Assess the relative merits of the alternatives. Describe the operational procedures, management strategies, and equipment required for the feasible alternatives. Estimate chemical dosages, level of operational expertise, and sensitivity of operation for the alternatives.

6. DESCRIBE POSSIBLE SHORT AND LONG-TERM PROCESS MODIFICATIONS TO OBTAIN OPTIMUM DISINFECTION AND CONTAMINANT REMOVAL.

Elements of Work

(a) Prepare a list of modifications which should be considered for detailed implementation evaluation. Provide an estimated cost and possible schedule for implementation for each of the proposed modifications.

It is not the purpose of this study to provide a detailed implementation scheme for plant rehabilitation. It is, however, necessary to scope the feasible short and long-term process modifications required to achieve optimum disinfection and contaminant removals.

(b) Incorporate (a) above in the draft report.

7. PREPARE A DRAFT REPORT FOR THE PROJECT COMMITTEE'S REVIEW. (8 COPIES).

Elements of Work

(a) The report must include all information for Work Tasks 1-6.

The information must be organized and presented in a logical and co-ordinated fashion. A general table of contents (Appendix C) is provided for organizing the material in a manner consistent with other plant reports.

Submit the draft report for review by the Project Committee.

(b) Meet with the Project Committee on site at least one week after submission of the report.

(c) Prepare a separate letter report containing recommendation(s) concerning the need for additional field testing to cover quality conditions not available during the period of this study. The Project Committee may decide to delay completion of the final report until field data can be obtained to confirm the predictions of performance for the worst case water conditions.